

A REVIEW OF *MELALEUCA* L. (MYRTACEAE) IN SOUTH AUSTRALIA

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Abstract

Twenty-one species of *Melaleuca* (Myrtaceae) are recognised in South Australia. Separate keys based on floral and vegetative characters are provided and each species is described and synonymy, distribution maps and line illustrations provided. The following changes to the South Australian species, as treated by Black and Eichler in the "Flora of South Australia" are incorporated. Two endemic species, *M. nanophylla* sp. nov. (North-western region) and *M. oxyphylla* sp. nov. (Eyre Peninsula region), are described. *M. linophylla* F. Muell. is treated as endemic to Western Australia and material previously referred to that species placed under *M. dissitiflora* F. Muell. Willis, "Handbook to plants in Victoria", vol. 2, 1972, is followed in treating *M. oraria* J.M. Black as a synonym of *M. neglecta* Ewart & Wood.

MELALEUCA L.

(Greek *melas*, black; *leukon*, white; so-called from the black trunk and white branches of some Asiatic form of *M. leucadendron* L.)

Shrubs or small trees; leaves opposite or scattered, entire, flat, concave, or terete, or rarely with recurved margins, nerves 1-7 or obscure; flowers white, yellowish or purplish-red, closely sessile, each subtended by a small caducous bract, 1-3 in the axil of each leaf and scattered or in a more or less close spike, or in terminal or lateral heads, the axis often growing out before or after flowering, bracteoles very small and deciduous or absent.

Calyx tube hollow, campanulate, adnate to the ovary at the base, the free part erect or scarcely dilated, lobes 5, herbaceous, or scarious and more or less confluent, deciduous or semi-persistent. *Petals* 5, orbicular, concave, spreading, usually with a short claw. *Stamens* numerous, longer than the petals and arranged in 5 bundles opposite them, the filaments in their lower parts united in a long or short, broad or narrow, usually flat column, in their upper parts free, filiform, arranged along the margin, clustered at the apex or also arising from the inner face of the column; anthers versatile, cells parallel, dehiscence longitudinal. *Ovary* enclosed in the calyx tube, inferior or semi-inferior, summit convex and villous, with a central depression round the style, 3-celled, ovules usually numerous on a peltate placenta.

*This paper was prepared as a precursor to the treatment in the third edition of J.M. Black's 'Flora of South Australia'. When the senior author died in January 1978 most of the descriptions had been prepared by him, including the Latin descriptions for the new species, and he had apparently finalized his concepts and the nomenclature except in the cases of subspecific taxa in *M. gibbosa* and *M. pauperiflora*. Mr Chorney did most of the preliminary sorting, checked identifications, made most of the detailed measurements on which the descriptions were based and prepared lists of specimens and distribution maps. Mr Dutkiewicz had completed the illustrations.

The only key was an almost completed vegetative key. Mr Chorney and I have since prepared the remaining descriptions (*M. gibbosa*, *M. glomerata*, *M. pauperiflora*, *M. squamea*, *M. squarrosa* and *M. uncinata*), drawing heavily on published sources, and prepared a second key. Except for these major items, all notes added since Mr Carrick's death are indicated by the use of square brackets.

In the lists of specimens examined all specimens cited are in AD unless otherwise indicated.

Types have in general not been examined, but those seen are indicated by reference to the herbaria to which they belong.

J.P. Jessop

Style filiform, stigma peltate, capitate or very small. *Fruit* small, sessile, sometimes embedded in the thickened stem; capsule enclosed in the enlarged woody calyx tube, opening loculicidally at the summit in three valves; perfect seeds few.

Over 100 species, almost entirely Australian, 21 in South Australia.

Key to the species (based on fertile material)

1. Leaves opposite 2
 Leaves alternate (sometimes sub-opposite or almost ternate)..... 12
2. Filaments red, pink or purple 3
 Filaments white, whitish or pale yellow..... 5
3. Staminal claw less than 2 mm long (much shorter than petals);
 fruiting rachis thickened 4
 Staminal claw more than 4 mm long (much longer than petals);
 fruiting rachis not thickened..... *M. wilsonii* 21
4. Leaves linear to oblanceolate, the apex straight or slightly incurved, obscurely
 veined, 5-15 mm long *M. decussata* 5
 Leaves ovate to obovate, the apex often recurved, distinctly 3-veined,
 2-6 mm long *M. gibbosa* 7
5. Leaves sessile 6
 Leaves distinctly (but often shortly) petiolate 8
6. Fruits closely compacted; leaves attached by a dorsal areole near the base
 (not recorded from N.W. or Lake Eyre regions)..... *M. adnata* 2
 Fruits clearly separated; leaves attached basally (only known from N.W. and
 Lake Eyre regions) 7
7. Leaf flat; fruit about 3 mm diameter *M. linariifolia* 12
 Leaf strongly revolute; fruit 9-10 mm diameter *M. corrugata* 4
8. Leaves distinctly 5-7-nerved, ovate to ovate-lanceolate *M. squarrosa* 19
 Leaves 1-3-nerved or veins obscure, linear to ovate-lanceolate 9
9. Leaf margins strongly incurved; fruits 9-10 mm diameter *M. corrugata* 4
 Leaf margins flat, concave above, or moderately recurved; fruits 3.5-4 mm diameter..... 10
10. Staminal claw about 4-5 mm long; leaves less than 3 times as long as broad *M. acuminata* 1
 Staminal claw about 1.5-3 mm long; leaves more than 3 times as long as broad 11
11. Staminal claw about 2-3 mm long, filaments yellowish; fruits almost spherical; leaves flat
 or very shallowly biconcave *M. oxyphylla* 15
 Staminal claw about 1.5 mm long, filaments whitish; fruits more or less cylindrical;
 leaves strongly convex below *M. halmaturorum* 9
12. Leaves mostly less than 1 cm long 13
 Leaves mostly more than 1 cm long..... 19
13. Filaments purple or pink *M. squamea* 18
 Filaments white to yellow 14
14. Leaves less than 1.5 mm long *M. nanophylla* 13
 Leaves 4-15 mm long 15
15. Fruits 2.5-3 mm across; leaves sessile *M. bracteata* 3
 Fruits 4-8 mm across; leaves petiolate 16
16. Stamens yellow; leaves pungent *M. leiocarpa* 11
 Stamens white to pale cream; leaves not pungent (small hardened tip or mucro may be present) 17
17. Fruit rough; leaves with two rows of prominent glands below *M. neglecta* 14
 Fruit more or less smooth; leaves apparently without glands 18
18. Leaves more or less flat, lanceolate; flowers in loose spikes; fruit wall hard, aperture partly
 constricted *M. lanceolata* 10
 Leaves subterete to terete, linear; flowers in heads; fruit wall thin, aperture
 usually not constricted *M. pauperiflora* 16
19. Leaves terete or plano-convex with a fine usually curved point 20
 Leaves flat, more or less linear, acute, sometimes with a short hard tip 21

- 20. Leaves terete, almost sessile; staminal claws each with 4-7 filaments *M. uncinata* 20
 Leaves plano-convex, distinctly petiolate; staminal claws each with 15-20 filaments . *M. raphiophylla* 17
- 21. Fruiting clusters dense, globular; leaves hairy when young *M. glomerata* 8
 Fruit in loose elongate spikes; leaves glabrous *M. dissitiflora* 6

Key to the species (based on vegetative material)

This key is by way of an experiment. The senior author was often confronted with problems in identification of specimens because of the absence of flowers or fruits or both, and the idea of a key based only on vegetative characters (in this case only on the leaves), although not new, was one which was compellingly attractive. Acquaintance, though slight, with species of *Melaleuca* from other States, particularly Western Australia, emphasized the problems to be encountered in producing such a key for a wider area, but within South Australia it is certain that this can work. The authors can name a plant from a single leaf, but this is due to intimate acquaintance, which is not an easy thing to put on paper in a key. There are, of course, problem areas and two basic conclusions must be stated: (1) if only vegetative material is available, the South Australian species of *Melaleuca* can be identified; (2) if flowers or fruit or both are available, identification is more rapid and more certain.

Many leaves, particularly in dried specimens, are young. Measurements given are based on mature leaves but even in these there is still a fairly wide range in size which may be due in some cases to differences in ecological factors of the habitat. Therefore, where a certain limit has been set to segregate species into two groups, measurements have been qualified by "mostly".

- 1. Leaves opposite 2
 Leaves alternate (sometimes sub-opposite or almost in whorls of 3) 11
- 2. Leaves sessile or almost so 3
 Leaves distinctly petiolate 7
- 3. Leaves ovate to obovate *M. gibbosa* 7
 Leaves linear-lanceolate or linear-oblancoelate 4
- 4. Leaf attached dorsally to the stem, the leaf-tip recurved *M. adnata* 2
 Leaf attached basally to the stem, the leaf-tip straight 5
- 5. Leaf 15-25 mm long *M. linariifolia* 12
 Leaf 5-15 mm long 6
- 6. Leaves linear-lanceolate *M. wilsonii* 21
 Leaves linear to oblanceolate *M. decussata* 5
- 7. Leaves not 3 times as long as broad 8
 Leaves at least 3 times as long as broad 9
- 8. Leaves 1-3-veined (often obscurely) *M. acuminata* 1
 Leaves distinctly 5-7-veined *M. squarrosa* 19
- 9. Leaves flat or thick and shallowly concave 10
 Leaves thin, concave; margins incurved *M. corrugata* 4
- 10. Leaves flat or very shallowly biconcave *M. oxyphylla* 15
 Leaves strongly convex on the lower surface *M. halmaturorum* 9
- 11. Leaves mostly less than 1 cm long 12
 Leaves mostly more than 1 cm long 18
- 12. Leaves sessile 13
 Leaves petiolate, even if only shortly so 14
- 13. Leaves 4-10 mm long *M. bracteata* 3
 Leaves less than 1.5 mm long *M. nanophylla* 13
- 14. Leaves pungent *M. leiocarpa* 11
 Leaves not pungent (small hardened tip or uncinat mucro may be present) 15
- 15. Leaves distinctly 3-veined *M. squamea* 18
 Leaves without obvious veins 16

16. Leaves with prominent glands on lower surface *M. neglecta* 14
 Leaf surfaces more or less smooth, without apparent glands 17
17. Leaves lanceolate, more or less flat, apex acute and often recurved *M. lanceolata* 10
 Leaves subterete or more or less compressed and thick, often with a very
 small mucro *M. pauperiflora* 16
18. Leaves terete or plano-convex with a fine usually curved point 19
 Leaves flat, more or less linear, acute, sometimes with a short hard tip 20
19. Leaves terete, almost sessile, young leaves with appressed silky hairs *M. uncinata* 20
 Leaves plano-convex, distinctly petiolate, young leaves glabrous *M. raphiophylla* 17
20. Leaves hairy when young, becoming almost glabrous, narrowly oblanceolate, with a
 very short hard point *M. glomerata* 8
 Leaves glabrous when young, narrowly linear-lanceolate *M. dissitiflora* 6

1. **Melaleuca acuminata** F. Muell., Fragm. 1(1858)15; Fragm.2(1861)178; Fragm. 5(1866)209; Benth., Fl.Austral.3(1867)132; Black, Fl.S. Austral.ed.1(1926)407; ed.2(1952)607; Blackall & Grieve, West. Austral.Wildfl.1(1954)297, in clave; Willis, Handb.Pl.Vict.2(1972)453.

[*Type*: "In montibus lapidosis ad rivum Mount Barker Creek (South Australia). L. Fischer."]

Glabrous shrub, 1-2 m high, bark rough, ashy, branches slender, virgate. Leaves decussate, lanceolate to ovate-lanceolate, acuminate, acute, sometimes with a very short callus point, spreading, more or less recurved and often slightly twisted towards the apex, 5-10 mm long, 2-4 mm broad, 3-veined, sometimes obscurely so, smooth above, punctate-glandular below, petiole decurrent, about 1 mm. Flowers on the previous year's branchlets in lateral clusters of 3-6; calyx tube about 2 mm long, glabrous, lobes more or less deltoid, about 1 mm long and broad, persistent; petals white or tinged with pink, almost circular, about 2 mm diameter; staminal claws about 4-5 mm long, bearing at the end 9-17 whitish filaments about 3 mm long; style about 3 mm long. Fruit almost globular, about 4 mm diameter, the more or less truncate apex bearing the woody remains of the calyx lobes. (Fig. 1.)

Mallée honey myrtle

Distribution (Map 1)

Western Australia, New South Wales, Victoria and South Australia.

Selection of Specimens examined

EYRE PENINSULA (7): *Eichler 19528*, 20 km E of Minnipa, 14.x.1967; *Kraehenbuehl 2029*, Hambidge C.P., 9.x.1966; *Rohrlach 64*, 10 km S of Kimba, 31.i.1959; *134*, Pinkawillinie, 15.ii.1959; *Wheeler 574*, 9 km S of Bascombe Well Homestead, 4.x.1967; *889*, Verran Hill track, 8.x.1968; *1036*, Hincks C.P., 11.x.1968.

NORTHERN LOFTY (8): *Copley 693*, Hd Wiltunga, 29.ix.1966; *Jackson 517*, 5 km S of Reeves Plains, 6.viii.1963; *Lothian 3046*, 5 km W of Kulpara, 3.xi.1964; *Velleman 22*, Kulpara North, 13.ix.1975.

MURRAY (9): *Czornij 710*, 15 km W of Murray Bridge, 22.vii.1974; *Schodde 680*, between Coomandook & Yumali, 26.xii.1954; *Sharrad 132*, between Cooke Plains & Elwomple, 28.ix.1959; *Specht 2292*, Billiatt C.P., 13.x.1960.

YORKE PENINSULA (10): *Blaylock 765*, 6 km SSE of Moonta, 30.ix.1967; *1041*, 8 km Arthurton to Maitland, 6.x.1968; *Copley 4457*, 3 km S of Browns Beach, 29.viii.1974; *Donner 1869*, 15 km S of Bute, 12.x.1966; *Eichler 13952*, 8 km S of Corny Point, 25.ix.1957; *Weber 3756*, 6 km N of Port Rickaby, 2.vii.1974.

SOUTHERN LOFTY (11): *Hunt 3025, 3027*, Finniss, 12.ix.1969, *3413*, Currency Creek, 13.x.1972; *Kuchel 27*, 13 km W of Gawler, 17.vii.1962.

KANGAROO ISLAND (12): *Crisp 387, 388*, Sapphoretown, 26.viii.1971; *Ising s.n.*, Macgillivray, 30.xii.1922; *Jackson 209*, Kingscote, 16.ix.1962.

SOUTH-EASTERN (13): *Carrick 3406*, Scorpion Springs C.P., 21.x.1973; *Eardley s.n.*, Lake Robe, -.vi.1938; *Sharrad 192*, Malinong, 29.ix.1959.



Fig. 1. *M. acuminata*. A, twig, nat. size; B, leaf, upper surface, x 3; C, flower, x 5; D, stamen bundle, x 10; E, fruits, nat. size.



Fig. 2. *M. adnata*. A, twig, nat. size; B, leaf, obliquely lateral view, x 4; C, inflorescence, nat. size; D, flower, x 5; E, stamen bundle, x 8; F, fruits, slightly reduced.

2. *Melaleuca adnata* Turcz., Bull.Phys.-Math.Acad.Petersb.10(1852)343; F. Muell., Fragm.8(1874)184; Black, Fl.S.Austral.ed.2(1952)609; Blackall & Grieve, West.Austral.Wildfl.1(1954)297, in clave.

[Type: Western Australia, Drummond V, 160 (MEL)]

Melaleuca eleutherostachya F. Muell. var. *abietina* Benth., Fl. Austral.3(1867)140.

[Type: Western Australia, Drummond V, 160 (MEL); J.S. Roe s.n.]

Shrub to 2 m high, spreading to 2-4 m wide, older branches ashy, rough, branchlets white, young shoots and leaves slightly villous, some becoming glabrous. Leaves descussate, sessile, attached by a dorsal circular or elliptic areole near the base, plano-convex or somewhat concave above, erect-ascending, recurved in the upper half, narrowly ovate-lanceolate, acuminate, acute, smooth above, roughly glandular-gibbous below, veins obscure, 5-7 mm long, 1-2 mm broad. Inflorescence spicate, flowers crowded on short lateral branches which do not grow out, rachis hairy; calyx tube campanulate, villous at the base, about 1 mm long, lobes almost semicircular, with a narrow scarious margin, ribbed, strongly incurved, about 1 mm long; petals almost circular, very concave, very caducous, about 2 mm diameter; staminal claws 3-4 mm long, bearing on the upper half 10-15 yellowish filaments 3-4 mm long. Style about 7 mm long, not expanded at the apex, stigma terminal. Infructescence 1.5-2 cm long, about 1 cm diameter, composed of 25-50 closely compacted woody fruits, slightly contracted at the orifice, each 3-4 mm long and broad. (Fig. 2.)

Hummock honey-myrtle

Distribution (Map 2)

Western Australia and South Australia.

Selection of Specimens examined

NULLARBOR (3): *Chinnock 2660*, 1.5 km E of Immarna, 29.ix.1975; *Gianakos 3180*, 5 km E of Immarna, 14.ix.1970.

GAIRDNER-TORRENS BASIN (4): *Gardiner s.n.*, 12 km S of Lake Everard Homestead 15.vi.1969; *Lay 103*, 40 km S of Mt Finke, 29.x.1970; *Weber 3192*, 15 km S of Lake Everard Homestead, 26.ix.1972.

EYRE PENINSULA (7): *Cleland s.n.*, Koonibba, 18.viii.1928, 5.vi.1946; *s.n.*, 50 km NE of Cowell, 6.xi.1936. *Copley 2472*, 50 km N of Cowell, 27.i.1969. *Hall s.n.*, 75 km S of Port Augusta, 23.i.1971. *Hilton 1618*, 16 km W of Minnipa, 20.viii.1955; *Ising s.n.*, Moonabie, 6.xi.1936; *s.n.*, Wudinna, 5.ix.1938; 9.ix.1938; *s.n.*, 19 km N of Minnipa, 14.ix.1938; *Kraehenbuehl 2094*, Hambidge C.P., 10.x.1966; *Lothian 4047*, 55 km NE of Wirrulla, 4.vi.1967; *Orchard 2939*, Iron Duke, 29.xi.1970; *Reid s.n.*, Lake Everard, 31.iii.1960; 30.ix.1966; *s.n.*, Euria W.H., 3.x.1966; *Rohrlach 307*, Pinkawillinie, 17.iv.1959; *Scoles 3*, 30 km NE of Wirrulla, 10.vi.1967; *Shaw s.n.*, Iron Duke, -iii.1962; *Spooner 2449*, 25 km S of Hiltaba, 5.ix.1972; *Symon s.n.*, 22 km N of Koonibba, 30.ix.1959; *8188C*, 6 km NW of Pine Lodge, 6.x.1972; *8222*, Koondoolka, 10.x.1972.

Notes

Turczaninow (1852) based his description of *M. adnata* on Drummond's 5th collection, no. 160. Mueller (1862, p.117) described an Oldfield collection from Western Australia [MEL, seen by Carrick] as *M. eleutherostachya*. Bentham (1867), apparently unaware of Turczaninow's publication, described Drummond's 5th collection, no. 160 [together with *Roe s.n.*] as *M. eleutherostachya* F. Muell. var. *abietina* Benth. Mueller (1874) refers to Turczaninow's paper and makes numerous changes, placing *M. eleutherostachya* in synonymy under *M. adnata*, and this is followed by Blackall & Grieve (1954). Black (1952) placed *M. eleutherostachya* and var. *abietina* under *M. adnata*. Beard (1970) maintained *M. adnata* and *M. eleutherostachya* as distinct species.

The original descriptions indicate distinctive differences between the two taxa, which have been confirmed on the types examined, particularly in the size of the leaves, the length of the staminal claws and the number of filaments, and it seems appropriate to retain *M. eleutherostachya* as a separate Western Australian species until its proper taxonomic position is determined. The South Australian collections belong to *M. adnata*.

3. *Melaleuca bracteata* F. Muell., *Fragm.*1(1858)15; *Fragm.*8(1874)184; Benth., *Fl.Austral.*3(1867)144; Eichler, *Suppl.Black's Fl.S. Austral.*(1965)233; Blake, *Contr. Queensl.Herb.*1(1968)65.

[*Type*: Queensland, Moreton Bay, *W. Hill s.n.* (MEL, lecto.); fide Blake (1968)65.]

Melaleuca glaucocalyx Gandoger, *Bull.Soc.Bot.France* 65(1918)26.

[*Type*: New South Wales, Murwillumbah, *Forsyth s.n.* (LY, holo.; BRI, NSW); fide Blake (1968)54.]

Melaleuca genistifolia Sm, var. *coriacea* Ewart, Kerr & Derrick, *Proc.Roy.Soc.Vict.ser.II*,38(1926)84.

[*Type*: Northern Territory, Finke River, *Kempe 431*(MEL); Arltunga, *Ewart s.n.* (? MEL); fide Blake(1968)54.]

Melaleuca monticola Black, *Trans.Roy.Soc.S.Austral.*58(1934)179; *Fl. S.Austral.* ed.2(1952)610.

[*Type*: South Australia, near Ernabella, *Cleland s.n.* (AD); Glen Ferdinand, *S.A. White s.n.* (AD) lecto., hic Carrickio designatus.]

Melaleuca daleana Blakely, *Austral.Nat.*11(1941)9.

[*Type*: Northern Territory, Connor's Well, *Dale s.n.* (NSW, holo.); fide Blake (1968)65.]

Tall shrub or small tree, 2-5 m high, sometimes with several stems from the base, intricately branched, bark greyish, rough, fissured, young branches and leaves pubescent becoming glabrous. Leaves crowded towards the ends of the branchlets, scattered, stiff, erect-ascending, sessile, narrowly elliptic-lanceolate, acute, 4-8 (rarely 10) mm long, about 1.5 mm broad, more or less concave above, obscurely 3-4-nerved, both surfaces copiously gland-dotted, sometimes obscurely so. Inflorescence a loose terminal spike, sometimes few-flowered, the axis soon growing out, rachis pubescent, bracts leaf-like but shorter, broader and more or less persistent; calyx tube shortly cylindric, about 2 mm long and broad,

pubescent outside, lobes ovate-acute or more or less triangular, sometimes shortly pointed, about 1 mm long and broad, pubescent outside, almost glabrous inside, sub-persistent; petals broadly ovate, concave, not clawed, about 2 mm long and 1.5 mm broad; stamens pale yellow, claws 2-3 mm long, bearing 15-25 filaments 2-3 mm long borne laterally from the middle and in two rows at the apex; style about 7 mm long, not expanded at the apex, stigma terminal, flat. Fruit hemispherical to shortly cylindrical, base rounded apex truncate, 2-2.5 mm long, 2.5-3 mm diameter, crowned by the lobes or, in older fruits, bearing the woody bases of the lobes as narrow rounded ridges. (Fig. 3.)

Bracteate honey-myrtle

Distribution (Map 2)

Western Australia, Northern Territory, Queensland, New South Wales and South Australia.

The disjunct distribution of this species in South Australia is noteworthy.

Specimens examined

NORTH-WESTERN (1): *Brumby s.n.*, Ernabella, 1937; *Cleland s.n.*, 25 km SW of Ernabella, 7.viii.1933; 8.viii.1933; *s.n.*, Ernabella, 26.ix.1945; *s.n.*, Kenmore Park, 15.iv.1950; *s.n.*, Mann Ranges, 21.viii.1954; *s.n.*, Musgrave Park, 2.vii.1961; *Reid s.n.*, Kenmore Park, 11.viii.1953; *Symon 2161*, 10 km W of Musgrave Park, 30.vii.1962; *2616*, Piltardi Creek, 9.viii.1962; *2704*, Kenmore Park, 12.viii.1962; *2697*, 48 km NW of Kenmore Park, 12.viii.1962; *Weber 243*, 30 km W of Musgrave Park, 2.xi.1966; *Whibley 992*, 17 km W of Musgrave Park, 6.ix.1963; *White 9*, Glen Ferdinand, 19.vii.1914; *Wilson 2528*, Piltardi, 8.viii.1962; *2578*, Kenmore Park, 12.viii.1962.

FLINDERS RANGES (5): *Saddler s.n.*, Upper Balcanoona Creek, 30.xi.1964; *Symon 3008*, Grindell's Hut Gorge, Balcanoona, 11.x.1964.



Fig. 3. *M. bracteata*. A, twig, nat. size; B, leaf, lower surface, x 4; C, flower, x 4; D, stamen bundle, x 8; E, fruits, slightly reduced; F, fruit, x 3.



Fig. 4. *M. corrugata*. A, twig, nat. size; B, leaf, upper surface, x 4; C, flower, x 2; D, stamen bundle, x 3; E, young fruit, nat. size; F, mature fruit, slightly reduced.

4. *Melaleuca corrugata* Black ex Eardley, in Black, Fl.S.Austral. ed.2(1957)945; *ibid.*, (1952)609, t.807; Eichler, Suppl.Black's Fl.S.Austral.(1965)232.

[Types: South Australia, summit of Mt Woodroffe, Musgrave Ranges, *Cleland s.n.*, (AD95701003, holo; AD95927021, AD97232108, CANB, K.)]

Tall shrub, much-branched from the base, 2-3 m high, branches dark grey or almost black, bark almost smooth. Leaves crowded on the young branchlets, more or less erect, very shortly petiolate or sessile, decussate, narrowly elliptic-lanceolate, cuneate, acute, appearing almost linear because of the strongly incurved margins, 1-nerved, 5-20(-30) mm long, 1-2 mm broad, upper surface smooth, lower surface with many prominent protruding glands, strongly scented of *Eucalyptus* when crushed. Flowers solitary, in spikes 2-4 cm long, formed at the base of incipient lateral branchlets, the axis soon growing out, subtending bracts broadly ovate, acuminate, concave, attached by a broad base, 4 mm long, 2.5 mm broad, caducous. Calyx tube flask-shaped, the lower part depressed-spherical, base flat, contracted above, 2.5-3.5 mm long, 3.5-4.5 mm diameter, lobes broadly ovate and obtuse or more or less rounded, about 1 mm long, 2 mm broad at the base; petals pinkish or white, broadly oblong or almost circular, slightly concave, 4.5-5 mm long, 3.5-4 mm broad, claw very short; stamens pale yellow, claw 6-7 mm long, bearing 25-35 filaments 6-8 mm long marginally from near the base and in two or three rows at the apex; style about 12 mm long, expanded at the apex, the stigma forming a circular rim around the central depression. Fruit grey or almost black, rough with the whitish scaly remains of the outer tissues giving the appearance of a "network of shallow depressions", depressed-spherical, base rounded, apex contracted and produced upwards bearing the remains of the bases of the calyx lobes, 6-7 mm long, 9-10 mm diameter, aperture 3-4 mm across. (Fig.4.)

Wrinkled honey-myrtle

Distribution (Map 3)

Probably also Northern Territory.

Specimens examined.

NORTH-WESTERN (1): *Cleland s.n.*, Mt Woodroffe, 18.iv.1950; *Hill & Lothian 687*, Mt Woodroffe, 28.vi.1958; 694, Mitchell's Nob, 29.vi.1958; *Kuchel 316*, Mt Lindsay, 6.viii.1962; *Reid s.n.*, Mt Lindsay, 26.vi.1967; *Symon 2569*, Mt Lindsay, 6.viii.1962; 2681, Mt Woodroffe, 11.viii.1962; *Spooner 132*, Mt Illbillee, -.ix.1968; *Wilson 2498*, Mt Lindsay, 6.viii.1962.

The script by Black on the holotype sheet cites "summit of Mt Woodroffe, Everard Range" in error.

5. *Melaleuca decussata* R.Br. ex Ait.f., Hort.Kew.ed.2(1812)415; DC., Prodr.3(1828)214; Benth., Fl.Austral.3(1867)133; Tate, Fl.Extratrop.S.Austral.(1890)92 in clave,231; Black, Fl.S.Austral.ed.1(1926)407, ed.2(1952)607, t.804; Eichler, Suppl.Black's Fl.S.Austral.(1965)232.

[Type: "Native of the South Coast of New Holland. *Robert Brown*, Esq. *Introduced* 1803, by Mr Peter Good."]

Melaleuca tetragona Lodd.ex. Otto, Horae Phys.Berol.(1820)37:

[Type: "Hort. Loddigens."]

Melaleuca parviflora Reichb., Ic.Bot.Exot.(1824)t.31.

[Type: "Habitat in Nova Hollandia. *Explic.Specimen cultum.*"]

Melaleuca pumila Otto ex DC., Prodr.3(1828)214; nom nud., in syn.

Melaleuca elegans Hornsch., Allg.Gartenz.2(1834)329.

[Type: Grown in the Berlin Bot.Gard. from seed from "Swan River."]

Melaleuca oligantha F.Muell. ex Miq., Nederl. Kruidk.Arch.4(1859)123.

[Type: New South Wales, without locality or collector, in Herb. Mueller.]

Melaleuca decussata var. *ovoidea* Black, Trans.R.Soc.S.Austral.49(1925)275.

[Types: "Kangaroo Island; Encounter Bay; Goolwa; southern Yorke Peninsula; South-East." Lecto., hic Carrickio designatus: South Australia, between Kingscote and Karatta, *Ayliffe s.n.*, (AD97631325).]

Tall slender shrub, usually 2-3 m high, sometimes attaining 6 m, branchlets white becoming dark grey, bark rough, fissured. Leaves sessile, more or less erect, decussate, linear to oblanceolate, cuneate, obtuse, concave above, glandular below, obscurely 3-veined, 5-15 mm long, 1-3 mm broad. Flowers in short lateral heads or spikes which are usually barren, or in fertile spikes at the bases of leafy branches, rachis glabrous; bracts narrowly ovate or ovate-acuminate, concave, glabrous, 3-5 mm long, 1-2 mm broad; bracteoles not seen; calyx tube sessile by a broad flat base, glabrous, about 1 mm long, lobes broadly rounded, about 0.5 mm long, 1 mm broad; petals purplish, almost spherical, about 2 mm long and broad, claw very short; stamens purple, claw about 0.5 mm long bearing 10-18 filaments 3-4 mm long in two series at the broad apex; style about 4 mm long, scarcely expanded at the apex, stigma convex. Fruit eventually deeply embedded in the thickened woody rachis, about 3-5 mm diameter, aperture about 2 mm across. (Fig. 5.)

Cross-leaf honey-myrtle; totem-poles

Distribution (Map 3)

Victoria and South Australia. Note that only one record is known from the South East region and two from Kangaroo Island.

Selection of Specimens examined

EYRE PENINSULA (7): *Alcock s.n.*, Hd Mortlock, -.x.1976. *Cleland s.n.*, Mt Dutton, 1.vi.1923. *Copley 2804*, Wharminda, 27.ix.1969. *Eichler 19313*, 7 km ENE of Bascombe Well Homestead, 6.x.1967. *Fagg 466*, 42 km S of Cummins, 25.xi.1967. *Orchard 3078*, Marble Range, 2.i.1971; *3039*. *Phillips s.n.*, 78 km from Port Lincoln towards Elliston, 22.ix.1965; *Specht 2097*, Blue Range, 9.xii.1959. *Symon 912*, Koppio road turnoff, 12.xi.1960. *Wheeler 569A*, 7 km SW of Bascombe Well Homestead, 3.x.1967.

YORKE PENINSULA (10): *Blaylock 1655*, Hd Ramsay, 29.xii.1970. *Carter s.n.*, Hd Carribie, 20.v.1962. *Orchard 2836*, 16 km NE of Foul Bay, 15.xii.1970. *Quinn 4*, Hardwicke Bay, 10.xii.1972. *Williams 7585*, 16 km WSW of Warooka, 22.i.1976.

SOUTHERN LOFTY (11): *Ashby s.n.*, Kangarilla, 4.xii.1920. *Carrick 3009*, 8 km N of Goolwa, 11.xi.1971. *Cleland s.n.*, Clarendon, 20.x.1913, 13.x.1920. *Crisp 49*, Cox's Scrub, 13.xii.1970. *Czornij 94*, 8 km NE of Waitpinga, 10.xi.1966. *Donner 437*, Mylor, 9.xii.1961. *Fieldhouse 99*, Cox's Scrub, 16.x.1975. *Grivell s.n.*, Currency Creek, 27.iv.1969. *Haegi 286*, 5 km S of Ashbourne, 1.iv.1973. *Ising s.n.*, Victor Harbour, 21.xi.1909. 18.i.1926. *Kraehenbuehl 1582*, 1 km N of Tanunda, 27.xi.1965.

KANGAROO ISLAND (12): *Ayliffe s.n.*, between Kingscote & Karatta, -.i.1907. *Cooper s.n.*, 24 km W of Cygnet River P.O., 2.i.1945.

SOUTH-EASTERN (13): *Hunt 1443*, The Gap, between Bordertown and Naracoorte, 8.xii.1962.

Comments

The production of spikes or short lateral heads composed only of male flowers, on plants which also produce spikes of hermaphrodite flowers, is a character frequently found in this species, and was noted also by Bentham (1867) and Willis (1972). These male flowers can be distinguished by the abortive ovary and the extremely short undeveloped style, as well as by the rounded base of the calyx tube. This latter feature, and the somewhat broader leaves, were the basis for Black's variety *ovoidea*. The type sheet of var. *ovoidea* has in Black's handwriting: "fls.all male in short or oblong ovoid heads", which is not in the original description, but was included in 1952. In fact, the flowers on the type are hermaphrodite and produce seeds. In other specimens examined, spikes of flowers with rounded bases were male and possessed normal leaves. Black (1925) lists a wide distribution for var. *ovoidea* which seems to have been based on the rounded calyx tube. The type specimen is 15 cm long, the end of a branch with a few branchlets, and there is no way of knowing whether older parts of the plant bore normal fertile inflorescences. Until there is further evidence derived by comparison with more complete material, particularly from the rather vague locality on Kangaroo Island, it is considered advisable not to recognize this variety.



Fig. 5. *M. decussata*. A, twig, x 3/4; B, leaf, lower surface, x 3; C, flower, x 7; D, stamen bundle, x 10; E, fruits, nat. size.



Fig. 6. *M. dissitiflora*. A, twig, x 3/4; B, leaf, lower surface, x 1 1/2; C, inflorescence, x 3/4; D, flower, x 4; E, stamen bundle, x 8; F, fruits, nat. size; G, fruit, x 3.

6. **Melaleuca dissitiflora** F. Muell., *Fragm.*3(1863)153; Benth., *Fl. Austral.*3(1867)144.
 [Type: "Inter flumen Bonney et montem Morphett (Northern Territory) J. Macd. Stuart. (MEL).]

Melaleuca trichostachya [non Lindl.] sensu Tate, *Fl. Extratrop. S. Austral.*(1890)92.

Melaleuca linophylla [non F. Muell.] sensu Black, *Fl. S. Austral. ed. 1*(1926)409.

Melaleuca linophylla [non F. Muell.] sensu Eichler, *Suppl. Black's Fl. S. Austral.*(1965)233.

Tall shrub to about 5 m high, young shoots slightly pubescent, branchlets green, branches pale grey, slightly fissured, bark of main stems somewhat papery. Leaves glabrous, scattered, narrowly linear-lanceolate, cuneate, acute, 2-3.5 cm long, rarely longer, 2-2.5 mm broad, flat or slightly concave above, obscurely 3-veined, very shortly petiolate. Spikes loose, on the young branchlets which soon grow out, rachis glabrous; flowers solitary, bract glabrous, 5-8 mm long, the basal part about 1 mm, broadly elliptic, concave, enclosing the flower bud, the upper part narrowly acuminate-acute, bracteoles absent, or very caducous; calyx glabrous or slightly pubescent outside, tube campanulate, about 2 mm long, scarcely contracted at the apex, lobes deltoid, about 1 mm long, 1 mm broad at base, pubescent inside, semi-persistent; petals white, slightly pubescent inside, broadly oval, about 2 mm long, claw short; stamens whitish, claw about 3 mm long bearing 15-25 filaments 2-3 mm long in two series on the upper half; style about 5 mm long, slightly expanded at the apex, stigma convex. Fruit grey, globose, slightly flattened, constricted at the apex, 2-3 mm diameter, aperture 1-2 mm across. (Fig. 6.)

Distribution (Map 3.)

Northern Territory, Queensland and South Australia.

Specimens examined

NORTH-WESTERN (1): *Cleland s.n.*, 16 km N of Ernabella, 16.viii.1933; *s.n.*, Piltardi Rockhole, 21.viii.1954; *s.n.*, Mann Ranges, 21.viii.1954; *s.n.*, Piltardi, 17.vi.1955; 4.vii.1961. *Reid 70*, Mann Ranges, 21.ix.1955; *s.n.*, Piltardi, 28.ix.1955. *Symon 2622*, Piltardi Creekline, 9.viii.1962; *2631*, 72 km W of Musgrave Park Homestead, 9.viii.1962. *Turvey s.n.*, Ernabella, 21.vii.1966. *Wilson 2526*, Piltardi Gorge, 8.viii.1962.

LAKE EYRE BASIN (2): *Cleland s.n.*, Coopers Creek, Innamincka, 29.v.1924. *Kuchel 2638*, Mt Hopeless road, 22.viii.1968.

FLINDERS RANGES (5): *Carrick 2028*, Paralana Springs, 24.viii.1968. *Donner 1124*, 3 km E of Nepabuna Mission, 1.ix.1964. *Freckleton 48*, Mt Serle Homestead, 6.ix.1965. *Gill s.n.*, Farina, -.v.1907. *Koch 419*, Mt Lyndhurst, -.ix.1898, -.xii.1898, -.viii.1899. *Kuchel 3056*, Arkaroola hot springs, 22.x.1971. *Lothian 2497*, Nepabuna Mission, 27.ix.1963; *4227*, 2 km W of Mulga View Homestead, 18.x.1967. *Rohrlach 640*, Arcoona Creek, 10.x.1959. *Schodde 836*, Mt Chambers Gorge, 2.ix.1958. *Symon 2989*, Grindells Hut, 12.x.1964; *4002*, Mt McKinley, 5.iii.1966; *5940*, Moolawatana Homestead, 22.viii.1968; *6053*, Paralana Springs, 24.viii.1968. *Whibley 2218*, between Wirrealpa and Blinman, 12.ix.1973.

Comments

Melaleuca dissitiflora closely resembles *M. linophylla* in vegetative characters, and the scarcity of specimens has led to some confusion, but it seems sufficiently distinct to be retained as a separate species until more adequate collections of *M. linophylla* are available.

Mueller (1862), in his description of *M. linophylla*, drew attention to the stamens, at most seven in each bundle and the phalanges (= total length?) 3-4 mm, and also to the fruit as being minute. "Stylus tantum 1" longus" is probably in error, because the flower is more or less protandrous, the style being the last organ to develop, and in newly opened flowers of other species it has been observed only 1 mm long. Mueller (1863), in his description of *M. dissitiflora*, regarded it as being close to *M. linophylla*, the main differences cited being in the widely spaced larger flowers, and the many filaments in each staminal bundle. He saw no fruits.

Bentham (1867), with only the type collections available, admitted both species, but suggested that *M. dissitiflora* may be but a variety of *M. linophylla*. He noted the difference in size of the flowers including the length of the staminal bundles, and the greater number of filaments in *M. dissitiflora*.

The description given by Black (1926) under *M. linophylla* fits *M. dissitiflora* more closely. Black (1952) omitted it from his second edition, and Eichler (1965) reinstated it. Collections at AD were annotated *M. linophylla*. However, Eichler realized that the name may have been misapplied, and sought an opinion from S. T. Blake, who wrote (pers. comm., 1972):

"*Melaleuca linophylla* is known to me only from the type and a collection of Burbidge's from S. of Port Hedland. I am enclosing a photograph of the type with my sketch of the calyx, a petal and a staminal bundle. Most of the flowers are immature. The specimen resembles some specimens of *M. dissitiflora* at first sight, but the flowers are smaller, the calyx usually hairy and the staminal bundles have fewer (6-11) filaments mostly in the upper part. The type of *M. dissitiflora* has widely spaced flowers but this is an accidental feature that is also often seen in *M. lanceolata*, *M. bracteata* and other species. In recent years *M. dissitiflora* has been found near Cloncurry in north-western Queensland though I have not found it myself."

Examination of the types at MEL confirmed this and showed also that the fruits of *M. linophylla* are cylindrical, about 1.5 mm long, 1.5 mm in diameter.

M. dissitiflora differs from *M. linophylla* in having larger flowers, longer staminal bundles with more filaments and larger sub-globose fruits. *M. linophylla* appears to be restricted to north-west Western Australia; *M. dissitiflora*, apart from its distribution in South Australia, occurs in south-central Northern Territory and north-western Queensland.

7. *Melaleuca gibbosa* Labill., Nov.Holl.Pl.Spec.2(1806)30, t.172; DC., Prodr.3(1828)215; Benth., Fl.Austral.3(1867)133; Tate, Fl.Extratrop.S.Austral.(1890)92, in clave, 231; Black, Fl.S.Austral., ed. 1(1926)407, ed.2(1952)607; Curtis, Fl.Tasm., ed.1(1956)201, ed.2(1975)204; Willis, Handb.Pl.Vict.2(1972)453.

[Type: "In terra Van-Leuwin" (Western Australia, but probably actually collected in Tasmania). *Labillardiere*.]

Tall glabrous shrub, usually 2-3 m high, branchlets white becoming dark grey, bark rough. Leaves sessile, spreading or more or less erect, decussate, ovate to obovate, subacute, concave above, keeled and glandular below, 3-veined, 2-6 mm long, 1-4 mm broad, often recurved in upper part, thick and rigid. Flowers decussate in lateral heads which soon become short spikes emitting leafy branches, rachis glabrous; bracts resembling the leaves but caducous before the flowers open; bracteoles not seen; calyx tube sessile by a broad flat base, glabrous, about 1.5 mm long and 2 mm broad, lobes very short to 0.5 mm long, 1 mm broad, almost truncate, scarious, caducous; petals purplish, about 1.5-2 mm long, 2 mm broad; stamens purple to pink, claw much shorter than petals bearing 15-20 filaments 2.5-3.5 mm long in two series at the broad apex; style about 3 mm long, scarcely expanded at the apex, stigma convex. Fruit eventually partially embedded in the thickened woody rachis, about 3-4 mm diameter, aperture about 2-3 mm across. (Fig. 7.)

Slender honey-myrtle

Distribution (Map 4)

Victoria, Tasmania and South Australia.

Selection of Specimens examined.

[EYRE PENINSULA (7): *Williams 9144*, 41 km W of Kyancutta, 17.ii.1977 (Herb. Ecological Survey of S.A.)]

YORKE PENINSULA (10): *Alcock 4566*, Innes National Park, 6.x.1974. *Cleland s.n.*, Marion Bay, 12.iv.1936. *Eichler 14059*, near Cape Spencer, 28.ix.1957. *Pretty 2*, Warrenben Hut, 4.v.1969. *Specht s.n.*, Ponalowie Bay, 5.ii.1959.

KANGAROO ISLAND (12): *Black s.n.*, Kingscote, -v.1914. *Cleland s.n.*, between Kingscote & Vivonne Bay, 16.xi.1924. *Jackson 351*, dam off Playford Highway, 3.xii.1963. *Mrongovius 37*, Eleanor River bridge, 1.vi.1972. *Phillips s.n.*, Cape Borda, 29.viii.1964. *Spooner 3794*, Harvey's Return, 12.xii.1974. *White s.n.*, Middle River, -.xi.1911. *Wilson 740*, Kelly Hill, 5.xi.1958.

SOUTH-EASTERN (13): *Black s.n.*, Bubbling Spring, 28.xii.1933. *Cleland s.n.*, Lake Bonney, 7.xii.1922; *s.n.*, 8-mile Creek, 31.x.1941; *s.n.*, Point Douglas, 3.xi.1941; *s.n.*, near Kingston, 4.vi.1965. *Copley 3347*, 25 km S of Robe, 14.i.1971. *Eileen 180*, Yallum, s.d. *Hunt 459*, ca. 30 km south-west of Naracoorte, 25.xi.1961. *Ising s.n.*, near Lucindale, 13.xii.1934; *s.n.*, Penola, 13.xi.1935. *Petherick s.n.*, Naracoorte, 27.xi.1933. *Roach 81*, ca. 3 km E of Lucindale, 29.xii.1970. *Tate s.n.*, Mt Julian, 24.xi.1882. *Weber 1930*, Big Heath, 8.xi.1969. *Welbourn 149*, Fairview Estate, 15.xii.1963. *Wilson 819*, Marsh's Swamp, 13.i.1968.

Comments:

M. gibbosa is similar to *M. decussata* in the broad base to the calyx tube, the purplish flowers, short staminal claw bearing about 15 filaments and the fruits eventually embedded in the enlarged woody rachis. The main distinguishing feature is in the leaves, which in *M. decussata* are linear or rarely oblanceolate, the apex straight or slightly incurved, obscurely veined and 5-15 mm long, while in *M. gibbosa* they are ovate or obovate, often recurved and distinctly 3-veined and 2-6 mm long. Willis (1972) has referred to one particular Victorian population of suspected hybrids between these two species.

[Carrick apparently intended to distinguish two varieties or subspecies of this species; one from Yorke Peninsula and Kangaroo Island with leaves about 3 mm or more long and then a new taxon from the South-East with shorter leaves. However, he did not prepare any descriptions and the differences appear likely to break down if the small sample of Victorian and Tasmanian specimens available in Adelaide is anything to go on. Two collections from near Naracoorte and Millicent in the South East region may be of this species but have 3-veined leaves to about 3 mm long but somewhat obtuse, not recurved and elliptic to oblanceolate.]



Fig. 7. *M. gibbosa*. A, twig, nat. size; B, leaf, lower surface, x 6; C, flower, x 6; D, stamens, x 6; E, mature fruits, x 1½; F, older fruits, x 1½.



Fig. 8. *M. glomerata*. A, twig, x ¼; B, leaf, x 1½; C, flower, x 6; D, stamen bundle, x 8; E, fruits, x 1/3.

8. *Melaleuca glomerata* F. Muell., Rep. Babbage Exped. (1859) 10; Benth., Fl. Austral. 3 (1867) 151; Tate, Fl. Extratrop. S. Austral. (1890) 92, in clava, 231; Black, Fl. S. Austral. ed. 1 (1926) 409, ed. 2 (1952) 610, t. 812; Blackall & Grieve, West. Austral. Wildfl. 1 (1954) 300, in clava; Eichler, Suppl. Black's Fl. S. Austral. (1965) 233.

[Types: "Lake Gregory, Arcoona, Lake Campbell. Occurs also on Sturt's Creek in the interior of N.W. Australia."]

Melaleuca hakeoides F. Muell. ex Benth., Fl. Austral. 3 (1867) 151.

[Type: "New South Wales, Mount Goningberi, near Cooper's Creek, Victoria Expedition."]

Low bushes to tall shrubs 2-8 m high; branchlets grey; bark papery. Leaves narrowed towards the base but sessile, alternate, narrowly oblanceolate, acute, with a very short hard point, more or less compressed, densely grey-tomentose or almost glabrous, 1.5-5 cm long, about 2 mm broad. Flowers in dense globular terminal heads, the axis growing out into a leafy branch after flowering, rachis pubescent; bracts broadly ovate, about 1.5 mm broad and 1 mm long, pubescent; bracteoles not seen; calyx tube sessile by a broad flat base, pubescent, about 1 mm long, lobes broadly ovate, to about 0.5 mm long, slightly broader than long; petals broadly ovate, about 1.5 mm long and broad, claw very short; stamens yellow, claw about 1 mm long bearing 4-8 filaments 2.5-4.5 mm long in two series at the broad apex; style about 4 mm long, scarcely expanded at the apex, stigma convex. Fruiting clusters dense, globular, 4-6 mm diameter and composed of 5-14 globular truncate 3-celled fruits about 1.5 mm diameter, aperture about 1 mm across. (Fig. 8.)

White tea-tree

Distribution (Map 4)

Western Australia, Northern Territory, New South Wales and South Australia.

Selection of Specimens examined

NORTH-WESTERN (1): *Black s.n.*, Mt Illbillie, 3.viii.1914. *Brundy s.n.*, Ernabella, 1937. *Eichler 17372*, near summit of Mt Morris, 7.ix.1963; *17458*, gorge north of Victory Well, 12.ix.1963. *Forde 921*, Officer Creek, -ix.1957. *Reid, W.C. 68*, Mann Ranges, 21.ix.1955. *Symon 2615*, Piltardi Creek 9.viii.1962; *3343*, between Betty & Ronald Well, -ii.1965. *Weber 244*, ca. 25 km west of Musgrave Park Station, 2.xi.1966. *White s.n.*, Glen Ferdinand, 19.cii.1914. *Wilson 2565*, Mt Woodroffe, 10.viii.1962.

LAKE EYRE BASIN (2): *Aitken s.n.*, Stuart Creek Waterhole, 10.xii.1964. *Black s.n.*, Murnpeowie Station, 26.vii.1920. *Cleland s.n.*, Lake Blanche, -vi.1924. *Hill 252*, Muloorina Station, 25.vii.1955, *498*, 14.xi.1955, ca. 8 km north of Marree. *Ising s.n.*, south of Charlotte Waters, 6.ix.1932. *Lothian 1404*, Dalhousie Springs, 8.viii.1963. *Mattner 26*, Strzelecki Track, 21.vi.1971. *White s.n.*, Petermorra Springs, -ix.1912.

GAIRDNER-TORRENS BASIN (4): McDouall Peak, *Black s.n.*, -v.1917.

FLINDERS RANGES (5): *Beck, s.n.*, Moolooloo Station, -x.1920. *Black s.n.*, Nepabunna, -viii.1937. *Cleland s.n.*, Leigh Creek, 15.x.1917; *s.n.*, Wirrealpa, 2.xii.1931. *Eichler 12874*, mouth of Arcaroona Creek gorge, 21.ix.1956. *Freckleton 49*, Mt Serle Homestead, 6.ix.1965. *Schodde 827*, St Georges Bluff, 2.ix.1958. *Symon 4037*, Muldara Rock, 4.iii.1966.

EASTERN (6): *Crisp 748*, Bibliando Station, 13.iv.1974. *White s.n.*, Lake Frome Basin, -xii.1920. *Williams 7419*, Hamiltons Creek, Lake Callabonna, 22.xi.1975.

9. *Melaleuca halmaturorum* F. Muell. ex Miq., Nederl.Kruidk.Arch.4(1859)122; Cheel, Trans.R.Soc.S.Austral.43(1919)369; Black, Fl.S.Austral. ed.1(1926)407, t.38; ed.2(1952)608, t.806; Ewart, Fl.Vict.(1931)861; Eichler, Suppl.Black's Fl.S.Austral.(1965)232; Willis, Hdbk.Pl.Vict.2(1972)453.

[*Type*: Kangaroo Island, "Ad flumen Three-Wells-river insulae Halmaturorum. *H. Heuzenroeder.*"]

Melaleuca pustulata [non Hook.f.] sensu Benth., Fl.Austral.3(1867)160, pro parte; [non Hook.f.] sensu Tate, Fl.Extratrop.S.Austral.(1890)93, in clave, 231.

Bushy shrub to 2 m or straggling much-branched tree to 7 m high, branchlets white, glabrous or finely pubescent when very young, branches with greyish papery deciduous bark. Leaves decussate, crowded, glabrous, ascending or spreading, petiole flat, appressed, about 1 mm long, lamina flat or slightly concave, more or less recurved, thick, smooth above, glandular-tuberculate below particularly when young, nerves obscure, linear-lanceolate, obtuse or somewhat acute, 3-7 mm long, 1-2 mm broad. Flowers in loose terminal spikes of 3-7, subtended by several pubescent, ovate, acuminate, acute bracts, the rachis also pubescent, the apex growing out; bracteoles apparently absent; calyx tube cup-shaped, glabrous, about 2 mm long, 1.5 mm broad, lobes triangular-acuminate-acute, glabrous outside, pubescent inside, about 1.5 mm long, 1 mm broad at base, semi-persistent; petals white, almost circular, about 2 mm long, claw very short; stamens whitish, claw about 1.5 mm long bearing 6-12 filaments 3-4 mm long near the apex; style about 8 mm long, slightly expanded at the apex, stigma flat. Fruits in small groups, woody, whitish-scaly, remains of calyx lobes often present, more or less cylindrical, not constricted at the apex, 3-3.5 mm long, 3.5-4 mm diameter. (Fig. 9.)

Kangaroo honey-myrtle; salt paper-bark

Distribution (Map 5)

Victoria and South Australia.

Selection of Specimens examined

EYRE PENINSULA (7): *Carrick 4021, 4025*, Spalding Cove, 22.x.1976. *Copley 2352*, 16 km SE of Streaky Bay, 13.x.1968. *Kuchel 1351*, Hambridge C.P., 22.x.1963. *Phillips s.n.*, 64 km from Elliston towards Port Lincoln, 4.ix.1962. *Specht 2127*, North Pearson I., 15.ii.1960. *Wilson 2669*, Stamford Hill, 21.v.1963.

MURRAY (9): *Cleland s.n.*, Chaunceys Line, 25.xi.1949. *Hilton 1535*, Samphire Swamp, 2.viii.1955. *Wheeler 102*, 20 km S of Murray Bridge, 27.x.1966.

YORKE PENINSULA (10): *Carrick 3895, 3896*, Innes N.P., 5.x.1974. *Eichler 14084A*, Marion Bay, 28.ix.1957. *Lothian 2601*, 20 km SW of Warooka, 13.x.1963. *Quinn s.n.*, 5 km NE of Yorketown, 26.ii.1971. *Weber 4244*, Royston Head, 11.x.1974.

SOUTHERN LOFTY (11): *Hunt 3073*, Hindmarsh River, 19.x.1969. *Fagg 114*, Outer Harbour, 31.x.1965. *Kraehenbuehl 231*, Camden, 31.x.1960. *Kuchel 474*, Torrens l., 22.iv.1963. *Smith 1536*, West Beach, 28.x.1968. *Spooner 3731*, Goolwa, 26.x.1974.

KANGAROO ISLAND (12): *Crisp 369*, Sapphiretown, 25.viii.1971. *Eichler 15465*, American River, 13.xi.1958. *Jackson 400*, 3 km W of Shoal Bay turnoff, 18.xii.1964. *Noble 608*, Pelican Lagoon, 7.iii.1973. *Wilson 895*, 3 km WSW of Kingscote, 13.xi.1958.

SOUTH-EASTERN (13): *Alcock 3098*, Eagle Nest Swamp, 10.xi.1969. *Carrick 2250, 2255*, Salt Creek to Meningie, 21.vii.1969. *Eichler 17758*, Bool Lagoon, 14.xii.1963. *Kuchel 2792*, 8 km S of Currawong, 13.ix.1968. *Stauffer 5399*, 31 km N of Kingston, 17.xi.1963.

Comments

Miquel (1859) published a description of *M. halmaturorum* and two varieties, var. *enervis* and var. *tuberculifera*, using manuscript names of F. Mueller. I do not think Miquel saw any specimens, and this was probably Cheel's opinion too. Cheel (1919) quoted the description in Miquel's paper and distinguished clearly between *M. halmaturorum* and *M. pustulata*, with which it had been confused, and which is, according to Curtis and Morris (1975), endemic to Tasmania. Cheel saw parts of the type collection of Heuzenroeder, but did not comment on the varieties which cannot be distinguished on the data given in Miquel's paper. Specimens obtained from the type localities of these varieties do not differ significantly from the type of *M. halmaturorum*.

10. *Melaleuca lanceolata* Otto, Horae Phys.Berol.(1820)36 (non R.Br. ex Baker, Proc.Linn.Soc.N.S.W.38(1914)601 = *M. deanii* F. Muell.); DC., Prodr.3(1828)212; Eichler, Suppl.Black's Fl.S.Austral.(1965)232; Blake, Contr.Queensl.Herb.1(1968)61.

[*Type*: From plant cultivated in Berlin Botanic Gardens (G-DC); fide Blake (1968)61.]



Fig. 9. *M. halmaturorum*. A, twig, nat. size; B, leaf, upper surface, x 5; C, leaf, lateral view, x 5; D, flower, x 5; E, stamen bundle, x 6; F, fruits, nat. size.

Fig. 10. *M. lanceolata*. A, twig, x 1/2; B, leaf, x 3, C, flower, x 4, D, stamen bundle, x 5; E, fruits, x 3/4.

Melaleuca pubescens Schau., Walp.Rep.Bot.Syst.2(1843)928; Black, Fl.S.Austral.ed.1(1926)409, ed.2(1952)610, t.810; Willis; Vict.Nat.65(1948)76; Blackall & Grieve, West.Aust.Wildfl.1(1954)301, excluding the synonym. *Melaleuca parviflora* Lindl. var. *pubescens* (Schau.)Domin. Bibl.Bot. 89(1928)457. *Cajuputi pubescens* (Schau.)Skeels, U.S.Dept.Agr., Bur.Pl.Ind., Bull.242(1912)41.

[Type: New South Wales, Lachlan River, *Cunningham 283/1817*, K, iso.; fide Blake (1968)61.]

Melaleuca curvifolia Schldl., Linnaea 20(1847)654.

[Type: South Australia, Light River, *Behr s.n.*, (MEL, G); fide Blake (1968)62.]

Melaleuca parviflora [non Lindl.] sensu Tate, Fl.Extratrop.S.Austral.(1890)93, in clave, 231.

Shrub or tree to 10 m high, bark black, rough, fissured, branchlets white, young shoots more or less pubescent, sometimes branchlets and leaves retaining pubescent or villous indumentum. Leaves scattered, ascending or spreading, petiole about 1 mm long, lamina thick, flat, more or less smooth, obscurely 3-nerved, linear to linear-lanceolate, acute, 5-15 mm long, 1-3 mm broad. Flowers mostly in threes, in loose, terminal, cylindrical spikes 1-5 cm long, the rachis pubescent or almost glabrous, the apex growing out before the flowers open; calyx tube oblong-cylindrical to almost turbinate, glabrous, 2-4 mm long, about 1.5 mm diameter, lobes triangular, obtuse, semi-persistent, pubescent inside, 0.5-0.9 mm long, 0.6-0.8 mm broad; petals white, almost circular, concave, about 1.5 mm across, claw about 0.5 mm; staminal claw 1-1.5 mm long bearing 8-14 filaments 4-5 mm long in two series at the apex; style about 8 mm long. Fruit ovoid or subglobose, 4-5 mm diameter, constricted at the apex, the aperture about 1 mm across. (Fig. 10.)

Moonah honey-myrtle

Distribution: (Map 6)

Western Australia, Queensland, New South Wales, Victoria, and South Australia.

Selection of Specimens examined

NULLARBOR (3): *Black s.n.*, Ooldea Soak, 26.ix.1920. *Lothian 3657*, 20 km S of Nullarbor H.S., 18.vii.1966. *Orchard 3184*, 2 km E of Dicks Plain Tank, 6.i.1971.

GAIRDNER-TORRENS BASIN (4): *Cleland s.n.*, Chances Swamp, 3.xi.1929.

FLINDERS RANGES (5): *Callen 19*, Mt Hack, 7-10.ix.1969; *Eichler 12893*, 15 km SE of Yadininna H.S., 23.ix.1956. *Whibley 466*, 22 km E of Parachilna, 29.iii.1959.

EASTERN (6): *Cooper s.n.*, 3 km N of Martin's Well, 28.ix.1942. *Warren 50*, Pualco Pass, 31.v.1969. *Williams 7008*, Bewley Bore, 2.ix.1975.

EYRE PENINSULA (7): *Alcock 75*, Lincoln N.P., 24.xi.1964. *Carrick 4017*, Cape Wiles, 22.x.1976; *Chinnock 1659*, Redcliff, 3.ix.1974. *Gale 72*, Wedge I., -iv.1971.

NORTHERN LOFTY (8): *Donner 1072*, Bethel, 13.v.1964. *Kraehenbuehl 52*, 4 km NE of Gladstone, 7.iii.1959. *Velleman 115*, Kulpara W, 9.ii.1976.

MURRAY (9): *Carrick 2927*, 24 km S of Swan Reach, 16.ix.1971. *Eichler 12234*, 10 km SW of Murray Bridge, 4.iii.1956. *Green 159*, Kinchina, 21.viii.1950. *Spooner 796*, Billiatt C.P., 15.vi.1970.

YORKE PENINSULA (10): *Copley 6*, 5 km W of Bute, 4.ii.1966. *Eichler 13957*, 8 km S of Corny Point, 25.ix.1957. *Weber 3738*, 3 km S of Port Julia, 2.vii.1974.

SOUTHERN LOFTY (11): *Chinnock 2438*, West Lakes, 31.viii.1975. *Hunt 2773*, Milang, 12.ii.1967. *Spooner 355*, 568, Torrens Gorge, 25.vi.1969.

KANGAROO ISLAND (12): *Black s.n.*, Antechamber Bay, 16.v.1884. *Haegi 417*, 7 km NW of Kingscote, 12.iv.1973. *Mrongovius 30*, Eleanor River bridge, 1.vi.1972.

SOUTHERN EASTERN (13): *Green 282*, Kingston, 26.viii.1950. *Hunt 423*, Bool Lagoon drain, 18.xi.1961. *Orchard 1027*, Mt Rescue N.P., 8.viii.1968.

Comments:

For a discussion of the rather involved synonymy see Blake (1968). The data and distribution given by Tate (1890) for "*M. parviflora*" are more appropriate to *M. lanceolata*, except for "fruits immersed in the axis" which must be an error, because South Australian species with such fruits do not match the rest of the data and are accounted for in the remainder of the key.

Bentham (1867) places *M. lanceolata* in synonymy with *M. genistifolia* Sm. and places *M. pubescens* Schau. in synonymy under *M. preissiana* Schau.; Blackall & Grieve (1954) place *M. preissiana* in synonymy under *M. pubescens*. *M. pubescens* is a synonym of *M. lanceolata*, a tree with dark fissured bark. *M. preissiana* is a paper-bark, restricted in distribution to the south-west of Western Australia.

M. lanceolata is a widespread species showing some variation in leaves and fruit, particularly in size. The leaves sometimes show a tendency to become thicker and somewhat terete, suggestive of hybridization with *M. pauperiflora* or adaptation to particular habitats. The fruits in some specimens are larger than the average and have a much wider aperture. The species merits a thorough taxonomic and autecological investigation.

[The denser flower-head and thinner-walled fruit with more open aperture can often be used to distinguish *M. pauperiflora* when plants vegetatively intermediate are encountered.]

11. *Melaleuca leiocarpa* F. Muell., Fragm.10(1876)55; Blackall & Grieve, West.Austral.Wildfl.1(1954)299, in clava; Eichler, Suppl.Black's Fl.S.Austral.(1965)233.

[Type: Western Australia "prope montem Churchmanii", *Young s.n.* (MEL).]

Shrub or tall shrub, 1-3 m high, glabrous except the inflorescence, branchlets rigid, ascending, bark greyish becoming black, fissured. Leaves scattered, appearing distichous because of the twisted flat 1.5 mm petioles, stiff, thick, flat, linear-lanceolate or linear-oblong, abruptly narrowed at both ends, the apex produced in a small pungent mucro, both surfaces smooth or glands more or less prominent, central and marginal veins obscure, 7-15 mm long, 2-3 mm broad. Spikes few-flowered, terminal, sometimes one or two lateral spikes at the base of the terminal one, the apices soon growing out, rachis pubescent; bracts stiff, pubescent particularly at the broad base outside, glabrous inside, ovate, obtuse, about 4 mm long and 2 mm broad, concave, caducous; calyx pubescent particularly towards the base, or almost glabrous, tube cup-shaped, about 3 mm long and broad, lobes triangular-ovate, obtuse, about 1.5 mm long; petals white, almost semicircular, broadly rounded at the apex, truncate at the base, slightly concave, about 2 mm long, 2.5 mm broad at the base, claw narrow, scarcely 1 mm long; stamens yellow, claw about 2 mm long, bearing 10-16 filaments 4-6 mm long in two rows at the apex; anthers about 1 mm long; style about 10 mm long; expanded at the apex, more or less convex on top with a central depression, the stigma situated on the rim. Fruit smooth, truncate-ovate, rounded at the base, slightly constricted at the apex, about 5 mm long and 6.5-8 mm diameter, rim thick, aperture about 3 mm across. (Fig. 11.)

Pungent honey-myrtle

Distribution (Map 7)

Western Australia and South Australia.

Specimens examined

South Australia

GAIRDNER-TORRENS BASIN (4): *Reid s.n.*, Lake Everard H.S., 30.ix.1966. [*Culic s.n.*, 33 km NNE of Kalanbi, s.d. (Herb. Ecological Survey of S.A.).]

EYRE PENINSULA (7): *Chinnock 2936*, 23 km NE of Poochera, 20.x.1975. *Lay 115*, 25 km N of Ceduna, 30.x.1970. *Reid s.n.*, N of Childara Rock-hole, 31.iii.1960. *Symon 8190D*, 19 km WSW of Yardea H.S., 6.x.1972.

Western Australia

Koch 1604, Watheroo, rabbit fence, -ix.1905; *P.G. Wilson 3507*, 9 km E of Southern Cross, 22.ix.1964.

Comments:

The type collection, found among unincorporated material at MEL, did not have flowers. The flowering specimens examined do not differ from the type, but do differ from Mueller's description, in that the length of the staminal claw is much shorter than the petal.



Fig. 11 *M. leiocarpa*. A, twig, slightly reduced; B, leaf, lower surface, x 3; C, flower, x 4; D, stamen bundle, x 5; E, fruits, x ¼.



Fig. 12 *M. linariifolia*. A, twig, x ¼; B, leaf, lower surface, x 2; C, flower, x 4; D, stamen bundle, x 5; E, fruits, nat. size.

12. *Melaleuca linariifolia* Sm., Trans.Linn.Soc.3(25 May, 1797,)278; Willd., Sp.pl.3(1802)1432; Sm., Exot.Bot.1(1804)109, t.56; DC., Prodr.3(1828)214; Benth., Fl.Austral.3(1867)140; F. Muell., Fragm.10(1876)55; Bailey, Queensl.Fl.2(1900)599; Beadle, Evans & Carolin, Hdbk.Syd.(1963)294; Eichler, Suppl. Black's Fl.S. Austral.(1965)233.

[Type: Cultivated in Cambridge, England, originally from "Port Jackson", New South Wales.]

Metrosideros hyssopifolia Cav., Icon.4(Sept.-Dec.1797)20. t.336.

[Type: New South Wales, "prope Jackson oppidum".]

Melaleuca stricta Hort.ex Dum.Cours., Bot.cult.ed.2, 5(1811)375, vide Jackson, Ind.Kew.2(1895)188.

Melaleuca trichostachya [non Lindl.] sensu Tate, Fl.Extratrop.S.Austral.(1890)92, in clave, 231.

Tree to 10 m high, bark thick, spongy, branches slender, almost smooth. Leaves slightly pubescent when young, mostly opposite, sessile, linear-lanceolate, tapering, acute, 1-3-veined, midvein more prominent on lower surface, concave, often keeled, usually closely gland-dotted on both surfaces, 15-25 mm long, 1-2 mm broad. Spikes more or less oblong, terminal and on short lateral branches, the apex soon growing out, rachis pubescent; bract ovate acuminate-acute, concave, hairy outside and in, margin ciliate in the lower half, 2.5 mm long, 2 mm broad near the base; bracteoles ovate, hairy outside and in, margin ciliate, about 1 mm long and not quite so broad; calyx glabrous, tube hemispherical, about 1.5 mm long, lobes deltoid-ovate, about 1 mm long and 1 mm broad at the base; petals white, sessile, circular, about 3 mm across, concave; stamens white, claw narrow, tapering, 6-7 mm long, bearing 30-60 filaments 1-2 mm long pinnately from near the base to the apex, anthers very small, about 0.2 mm long; style about 8 mm long. Fruit hemispherical, base rounded, apex truncate, not constricted, 2 mm long, 3 mm diameter, valves slightly exserted. (Fig. 12.)

*Narrow-leaved honey-myrtle**Distribution* (Map 7)

Northern Territory, Queensland, New South Wales and South Australia.

*Specimens examined**South Australia*

LAKE EYRE BASIN (2): *Boomsma s.n.*, Callamurra W.H., 19.xi.1975. *Cleland*, Coopers Creek, 29.v.1924. *MacGillivray s.n.*, Coopers Creek, -.x.1920. *Johnson s.n.*, Dig Tree, 17.vi.1972. *Symon 5835*, Dig Tree, 19.viii.1968.

Northern Territory

Willis s.n., Palm Valley, 16.ix.1965. *Forde 689*, Standley Chasm, 3.xi.1956. *Cleland s.n.*, Finke Gorge, 17.viii.1929.

Queensland

Carrick 1924, Nappa Merrie, 20.viii.1968. *Jackson 427*, Nappa Merrie, 12.viii.1962. *Adams 1319*, 24 km N of Alpha, 24.ix.1964. *Story & Yapp, 340*, 31 km S of Rolleston, 14.x.1962.

New South Wales

Boorman s.n., Wyong, -.xi.1916. *Cleland s.n.*, Rydalmere, 12.xi.1909. *s.n.*, Ourimbah, -.xi.1911; *s.n.*, Dungog, 7.xi.1916.

Comments:

Melaleuca alternifolia (Maiden & Betche) Cheel (1924), originally regarded as a variety of *M. linariifolia* by Maiden & Betche (1904), is distinct [but does not occur in South Australia]. The relationship between *M. linariifolia* Sm. and *M. trichostachya* Lindl. is not clear.

Smith (1797, 1804) described *M. linariifolia* as follows, from material collected at Port Jackson, introduced into England in 1793, and cultivated at Cambridge, see Donn (1845) and Cheel (1922): large tree, bark thick and spongy, branches round or slightly angular, smooth; leaves opposite (however, the accompanying plate (1804) shows the leaves alternate or scattered, or at most sub-opposite), linear-lanceolate, acute, not pungent, smooth above, multi-spotted below, 3-nerved; flowering branchlets terminal, loose, the apex growing out, flowers solitary, opposite, sessile, white; filaments very long, pinnate, produced from near the base to the summit; fruit smooth, hemispherical.

Lindley (1848) described *M. trichostachya* as follows, from material collected on the Belyando River during Mitchell's 1846 expedition: leaves more often opposite, linear, flat, very acute at both ends; spikes terminal, rather lax, rachis pilose, calyx glabrous, lobes herbaceous; staminal bundles with many anthers, the claw shorter than the petals.

Bentham (1867) reduced *M. trichostachya* to varietal rank under *M. linariifolia*, citing the following differences: leaves usually smaller flowers smaller in loose spikes, bracts very narrow, stamens more crowded on a shorter claw, fruiting calyx more open. Within the variety he included collections from Coopers Creek.

Mueller (1889) retained *M. trichostachya*; Bailey (1900, 1913) followed Bentham in placing it within *M. linariifolia*.

Baker & Smith (1906, 1910), in their investigations of the essential oils in *Melaleuca*, were able to distinguish chemically between the two taxa and on this basis, as well as morphological and anatomical data, regarded *M. trichostachya* as of specific status, giving it a very wide distribution "from the moist coast region to the arid interior (Coopers Creek) and yet constant in character throughout."

Cheel (1922) disagreed with Baker & Smith regarding identification of some collections, placing them in *M. linariifolia*. Apparently, neither Cheel nor Baker & Smith examined specimens from Central Australia, quoting Bentham from Coopers Creek and Mueller from South Australia and North Australia.

From the various descriptions, two characters appear to be distinctive: staminal claws long with pinnate filaments, and bracts broad (by inference!) for *M. linariifolia*; staminal columns short with crowded filaments, and bracts very narrow for *M. trichostachya*. Central Australian collections held at AD are from south-western Queensland, southern Northern Territory and north-eastern South Australia (including Coopers Creek). These are smaller in leaf size compared with coastal collections, but little different in flower size or inflorescence. However, they do have long staminal claws with pinnate filaments, and broad bracts. Until critical examination of a wide range of specimens elucidates the relationships between *M. linariifolia* Sm. and *M. trichostachya* Lindl., the South Australian specimens are more appropriately placed in the former.

13. *Melaleuca nanophylla* Carrick, sp. nov.

Typus: N.N. Donner 3894, "ca. 35 km west of Emu, approx. 28° 33'S 130° 54' E", 16.vii.1972 (AD, holotypus; isotypi: CANB, MEL, PERTH, K, E, B, NY, A-GH, L).

Arbor parva, ad 5 m alta; ramuli glabri, albi, tenuissimi, brevissimi, copiosissimi, excavati; rami atrocineri, cortice aspero plus minusve fissurato, *Folia* conferta, spiraliter disposita, glabra, laevia, sessilia, ad basin lateraliter affixa, amplectentia, decidua, late obovata, base truncata, apice late rotundata vel obtusa interdum acuta, infera convexa saepe carinata, supra crista crassa hippocrepiformi, obscure trinervia, glandulis inconspicuis, plerumque minus quam 1.5 mm longa et 1 mm lata. *Flores* 1-3 in axillis foliorum, rhachidi pubescenti, bracteis bracteolisque minutis, pubescentibus, ovato-acuminatis, minus quam 1 mm longis 0.5 mm latisque; *calyx* tubo cyathiformi, glabro, laevi, circa 1 mm longo, lobis glabris, late ovatis vel semicircularibus, marginibus scariosis, obscure nervosis, circa 0.5 mm longis, vix 1 mm latis; *corolla* albida, glabra, petalis oblongis, concavis, ad basin truncatis, marginibus plus minusve ciliatis, circa 1.5 mm longis, 1 mm latis, unguis perbrevibus; *stamina* flavida, ungue circa 2.5 mm longa, 6-12 filamentis 1-2 mm longis apicem versus in seriebus duobus; *stylus* circa 4 mm longus, ad apicem non expansus, stigma fere plana. *Fructus* subglobosus, circa 2 mm diam apice vix constrictus, albidus, decorticatus, calycis loborum vestigiis lignosis coronatus.

Small tree 3-5 m high, branchlets short and very numerous, glabrous, densely clothed with very deciduous leaves particularly on drying, eventually only a few remaining at the apices, leaving a very slender white stem excavated where the leaves were attached, branches dark grey, bark rough, more or less fissured. Leaves spiral, crowded, glabrous, smooth, sessile, attached laterally at the base which clasps the stem, broadly ovate, base truncate, apex broadly rounded or obtuse sometimes acute, lower surface convex, often ridged, upper surface with a thick horseshoe-shaped ridge above the oblong point of attachment, obscurely 3-veined, glands not conspicuous, less than 1.5 mm long and 1 mm broad. Flowers 1-3 in the axils, in short spikes, rachis pubescent, bracts and bracteoles minute, pubescent, ovate-acuminate, less than 1 mm long and 0.5 mm broad; calyx tube cup-shaped, glabrous, smooth, about 1 mm long, lobes broadly ovate or simicircular, apex short, obtuse, border narrow, scariosus, about 0.5 mm long, almost 1 mm broad at base, obscurely veined; corolla whitish, petals concave, oblong, truncate at base, margin more or less ciliate, about 1.5 mm long, 1 mm broad, claw very short; stamens pale yellow, claw about 2.5 mm long, bearing 6-12 filaments 1-2 mm long in two series at the apex; style about 4 mm long, not expanded at the apex, stigma almost flat. Fruit almost spherical, about 2 mm diameter, crowned by the woody bases of the calyx lobes scarcely constricted at the apex, the outer tissues whitish, thin, papery, peeling. (Fig. 13.)

Dwarf-leaved honey-myrtle

Distribution (Map 7)

Endemic to South Australia.

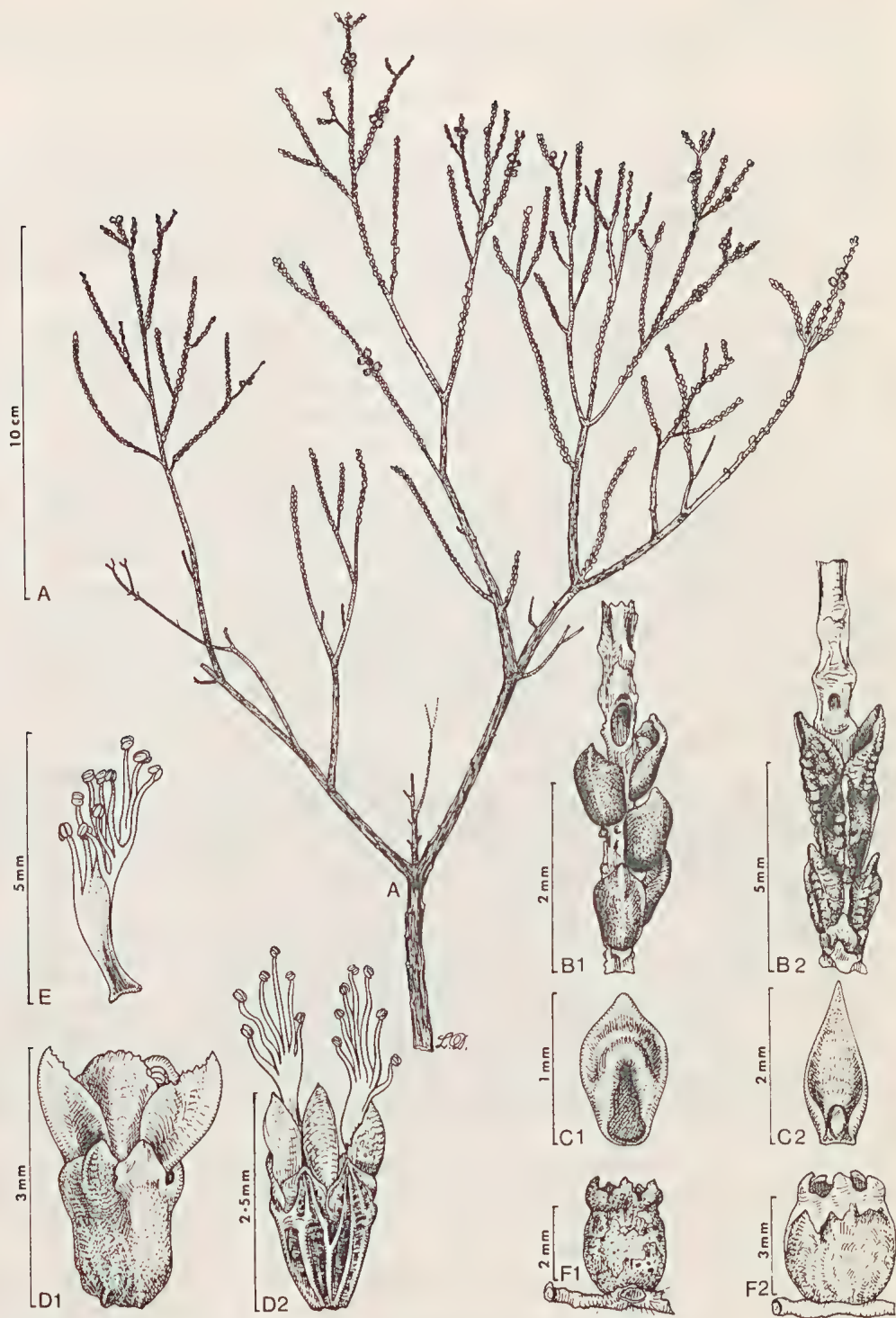


Fig. 13. *M. nanophylla*. A, twig; B1, leaves; C1, leaf, upper surface; D1, flower; E, stamen bundle; F1, fruit. *M. minutifolia*. B2, leaves; C2, leaf, upper surface; D2, flower; F2, fruit.

Specimens examined

NORTH-WESTERN (1): *Donner 3894*, 35 km W of Emu, 16.vii.1972. *Forde s.n.*, 32 km W of Emu, 3.ix.1956. *Lothian 3915*, 35 km W of Emu, 31.v.1967; *5623, 5624*, 32 km W of Emu, 17.vii.1972; *5665*, 40 km S of Vokes Hill, 19.vii.1972. *Reid s.n.*, Spanners Highway, 24.vi.1967; *s.n.*, 24 km N of Emu, 25.vi.1967; *s.n.*, 32 km W of Emu, 25.vi.1967. *Walker s.n.*, Emu-Maralinga area, -.ix.1968.

Comments:

Bentham (1867) regarded his arrangement as artificial and in consequence some species were distantly removed from those which may be more closely related. The affinities of *Melaleuca nanophylla* can be assessed only in a revision of the genus when investigation of the taxonomic significance of the various characters elucidates the relationships between species. According to Bentham's grouping, *M. nanophylla* fits into his series *Peltatae*, containing a number of species with which it may be confused. The distinctive characters are given below.

There are two Western Australian species, both from the South Western Province. 1. *M. micromera* Schau. (1844) differs in having: leaves in whorls of three, mostly less than 1 mm long, with a thick, circular or horse-shoe-shaped ridge on the lower surface; branchlets pubescent, as are also the leaf-excavations; fruits shallowly cup-shaped, 1.5-2 mm long, 2.5-3 mm diameter at the expanded thickened margin which carries the persistent woody calyx lobes surrounding the persistent style. 2. *M. thyoides* Turcz. (1847) differs in having: pubescent branchlets with glabrous leaf-excavations; closely appressed, broadly ovate, ciliolate leaves only 0.5 mm long and slightly broader; fruits more or less compacted.

There are two Queensland species, from Leichhardt District and Cape York Peninsula respectively. 1. *M. tamariscina* Hook. (1848) differs in having: closely appressed, concave leaves with ciliolate margins, mostly 0.5 mm long, seldom 1 mm; closely clustered fruits 3-4 mm diameter, very constricted at the apex the aperture 1-1.5 mm across. 2. *M. foliolosa* A. Cunn. ex Benth. (1867) differs in having: pilose branchlets with glabrous leaf-excavations; closely appressed, more or less diamond-shaped leaves with ciliolate margins, central attachment and acute base and apex; subglobose fruits about 3.5 mm diameter, constricted at the apex, the aperture 2.5 mm across.

M. minutifolia F. Meull. (1859) has a wider distribution than the others, extending from the King Leopold Ranges of Western Australia, through the Katherine district of Northern Territory, to the Flinders River in Queensland, and this name has been applied on herbarium sheets to the new species. It differs in having: decussate, concave, acuminate-acute leaves, 3-5-veined, 1.5-3.5 mm long; strongly ribbed calyx tube when young; fruits larger, about 3 mm diameter. (fig. 13.)

The following rearrangement of series *Peltatae* in Bentham's key accommodates the new species. Excavation of the branchlets is a character too indecisive for primary subdivision, and several important characters, such as length of staminal claw and number of stamens, are incompletely known. Turczaninow's original description of the disposition of the leaves as "decussate" in *M. thyoides* is an understandable error because of the very crowded overlapping arrangement. Bentham (1867) and Blackall & Grieve (1959) correctly use the term "spiral". There is also some variation in *M. thyoides*, a species not easy to differentiate from *M. tamariscina*,

Peltatae — leaves very small, often scale-like, more or less peltately attached. Flowers small, in heads or spikes, usually dense.

1. Leaves in whorls of 3, or decussate 2.
- Leaves spirally or irregularly arranged 5.
2. Leaves in whorls of 3; flowers strictly dioecious; stamens few in each bundle 95. *M. micromera*
- Leaves decussate 3.
3. Branchlets hairy; flowers few in heads; stamens numerous in each bundle 94. *M. foliolosa*
- Branchlets glabrous 4.

- 4. Leaves obtuse, spreading, 2-4 mm long 92. *M. deltoidea*
 Leaves pointed, erect, usually less than 2 mm long 93. *M. minutifolia*.
- 5. Upper surface of leaf with a horse-shoe-shaped ridge, margin not ciliate;
 spikes few-flowered 98. *M. nanophylla*
 Upper surface of leaf concave, margin ciliate 6.
- 6. Spikes more or less dense; fruiting spikes ovoid-globular or shortly oblong,
 often compact 96. *M. thyoides*
 Fruiting spikes oblong-cylindrical, sometimes more or less loose 97. *M. tamariscina*.

14. ***Melaleuca neglecta*** Ewart & Wood, Proc.R.Soc.Vict.n.s.23(1910)60, t.13, f.1, 2, 4; Black, Fl.S.Austral.ed.2(1952)612, t.815; Willis, Hdbk.Pl.Vict.2(1972)455.

[Type: Victoria, near Bimboola, *St. Eloy D'Alton s.n.*]

Melaleuca ericifolia [non Sm.] sensu Tate, Hdbk Fl.Extratrop.S.Austral.(1890)93 in clave, 231.

Melaleuca fasciculiflora [non Benth.] sensu Black, Fl.S.Austral.ed.1(1926)410.

Melaleuca oraria Black, Trans.R.Soc.S.Austral.69(1945)309; Black, Fl.S.Austral.ed.2(1952)612, t.814.

[Type: South Australia, Beachport, *Black s.n.* (AD 97632082, lecto., hic Carrickio designatus).]

Tall shrub 2-3 m high, bark dark, rough, corky, fissured, branchlets white, long and slender, more or less erect. Leaves scattered or almost in whorls of 3, crowded on the branchlets, erect or ascending, narrowly linear-lanceolate, obtuse, apex slightly incurved, plano-convex, two rows of prominent glands on lower surface, 4-8 mm long, about 1 mm broad, petiole almost 1 mm long. Flowers in short axillary spikes on the previous year's branches, forming long dense or interrupted inflorescences, rachis glabrous; bract depressed ovate, concave, glabrous, semi-persistent, about 1 mm long, 1.5 mm broad; bracteole ovate, margin ciliate, about 1 mm long, 0.5 mm broad; calyx glabrous outside, cup-shaped, tube 2.5 mm long, lobes triangular acute, about 1 mm long and 1 mm broad at the base, hairy inside; petals white, broadly ovate-oval, apex rounded, entire or more or less lacinate, about 2 mm long and broad, concave; stamens pale cream, claw about 1.5 mm long, bearing 8-16 filaments 2-4 mm long in two rows at the apex; style about 6 mm long, slightly expanded at the apex, stigma a ring around the central depression. Fruit rough, corky, fissured, more or less cylindrical, base rounded, apex truncate, 3-4 mm long, 4-5 mm diameter, rim very thick, aperture about 2.5 mm across. (Fig. 14.)



Fig. 14. *M. neglecta*. A, twig, x 2/3; B, leaf, lower surface, x 4; C, leaf, lateral view, x 4; D, flower, x 4; E, stamen bundle, x 5; F, fruits, nat. size.

Mallee honey-myrtle, D'Alton's melaleuca

Distribution (Map 8)

Victoria and South Australia.

Selection of Specimens examined

EYRE PENINSULA (7): *Alcock s.n.*, Pillana, -.x.1963; 1672, Whites Flat, 26.x.1967; 2521, N Gawler Pond, 24.x.1968. *Cleland s.n.*, Tod River reservoir, 7.xii.1959. *Jackson 1201*, 15 km SSE Bascombe Well H.S., 7.x.1967. *Newman s.n.*, Streaky Bay, 23.viii.1959. *Specht 2658, 2659*, Lincoln N.P., 10.xi.1960. *Swaby s.n.*, Coffin Bay, 27.iv.1969. *Symon s.n.*, Koppio School, 12.xi.1960. *Williams 5901*, Charleton Gully swamp, s.d.

NORTHERN LOFTY (8): *Cleland s.n.*, Light River, 27.iv.1968. *Kuchel 1137*, Tarlee, 26.viii.1963.

MURRAY (9): *Cleland s.n.*, Mannum, 13.iv.1924. *Newman s.n.*, Harrison Creek, 23.vii.1960. *Spooner 1254*, Caloote, 15.v.1971.

SOUTHERN LOFTY (11): *Eichler 14544*, Yankalilla River, 19.xi.1957. *Kraehenbuehl 248*, Goolwa to Tooperang, 19.xi.1960. *Spooner 206*, Windsor Gardens, -.iii.1968; 2775, Noarlunga, 15.iv.1973; 4317, Delamore, 1.xi.1975.

KANGAROO ISLAND (12): *Crisp 368*, Sapphiretown, 25.viii.1971. *Eichler 15180*, 3 km W of Kellys Hill, 4.xi.1958. *Jackson 889*, Stunsail Boom River, 28.xi.1971. *Wilson 823*, Hanson Bay, 9.xi.1958.

SOUTH-EASTERN (13): *Alcock 3195*, Big Heath N.P., 18.xi.1969. *Beaglehole 5938*, Yallum, 15.xii.1963. *Carrick 2502*, Currawong H.S., 19.x.1969. *Hunt 374*, 10 km W of Naracoorte, 11.xi.1961. *Symon 8377*, 17 km SE of Keith, 10.xi.1972.

Comments

[Willis (1972) is followed in treating *M. neglecta* and *M. oraria* as synonymous.]

15. *Melaleuca oxyphylla* Carrick, sp. nov.

Typus: D.E. Symon 8091A, "Gawler Ranges, hills 21 km SW of Yardea", 2.x.1972, (ADW, holotypus; isotypi: AD, CANB, NSW, K).

Frutex ad 2 m altus, innovationes pubescentes, ramuli virgati, adscendentes, albidii, rami cinerei, leviter fissurati. *Folia* decussata, conferta, glabra, recta vel adscendentia, imbricata, floralia patentia, petiolo circa 1 mm longo, lamina lineari-lanceolata, acuminata, acuta, fere plana aut apicem versus incurvata vel recurvata, margine crassa, infera glandulosopunctata, 8-12 mm longa, 1-1.5 mm lata. *Flores* 2-5, in spicas perbreves axillares, rhachide glabra, pedunculis aliquot bracteis membranaceis imbricatis lanatis subtentibus, bracteolis ut videtur nullis, in inflorescentiis laxis 5-15 cm longis dispositus; *calyx* tubo fere glabro, cyathiformi, circa 2.5 mm longo latoque, lobis deltoideis, circa 1 mm longis latisque, extus pubescentibus, intus glabris, margine scariosa; *corolla* albida, glabra, petalis fere circularibus, concavis, circa 2.5 mm latis, unguibus perbrevis; *stamina* luteola, ungue circa 2-3 mm longa, 9-15 filamentis 2-3 mm longis apicem versus pinnatis; *stylus* circa 4 mm longus, ad apicem vix expansus, stigma convexa. *Fructus* subglobosus, circa 3.5 mm longus, 4 mm diam., ad apicem constrictus, apertura 1-1.5 mm diam.

Shrub 1-2 m high, very young shoots pubescent; branchlets long, slender, ascending, whitish; branches grey, slightly fissured. Leaves decussate, crowded, erect or ascending, more or less patent in flower, glabrous, petiole about 1 mm long, lamina linear-lanceolate, acuminate-acute, almost flat or with the upper part incurved or recurved, margin thickened, glandular-punctate below, 8-12 mm long, 1-1.5 mm broad. Flowers 2-5, in very short axillary spikes, rachis glabrous, peduncles subtended by a few woolly, imbricate, membranous bracts, bracteoles apparently absent, forming loose inflorescences 5-15 cm long; calyx tube almost glabrous, cup-shaped, about 2.5 mm long and broad, lobes deltoid, about 1 mm long and broad, pubescent outside, glabrous inside, margin scarious, semipersistent on young fruits; corolla whitish, glabrous, petals almost circular, concave, about 2.5 mm across, claw very short; stamens yellowish, claw about 2-3 mm long bearing 9-15 filaments 2-3 mm long pinnately on the upper part; style about 4 mm long, slightly expanded at the apex, stigma convex. Fruits smooth, almost spherical, about 3.5 mm long, 4 mm diameter, constricted at the apex, aperture 1-1.5 mm across, borne in scattered clusters on the old wood. (Fig. 15.)



Fig. 15. *M. oxyphylla*. A, twig; B, leaves; C, flower; D, stamen bundle; E, fruits.

*Pointed-leaved honey-myrtle**Distribution* (Map 8)

Endemic to South Australia.

Specimens examined.

EYRE PENINSULA (7): *Copley 2777*, 25 km E of Kimba, 3.viii.1969. *Hill 645*, 37 km Kimba to Cowell, 10.xi.1957. [*Lang 1236*, near Corrobinnie Hill, 16.ii.1978.] *Leiblich s.n.*, Darke Peak, 16.xi.1969. *Orchard 2284*, 2292, 35 km N of Minnipa, 26.ix.1969. *Rohrlach 277*, 10 km SSW of Kimba, 11.iv.1959; 683, 30 km NW of Kimba, 13.x.1959; 689, 24 km W of Kimba, 18.x.1959. *Spooner 2495*, Scrubby Peak, 8.ix.1972. *Symon 8091A*, 21 km SW of Yardea, 2.x.1972. [*Williams 9142*, 38 km W of Kyancutta, 17.ii.1977 (Herb. Ecological Survey of S.A.).] *Wilson 200*, 22 km SSE of Kimba, 4.x.1958.

Comments

M. oxyphylla fits into series *Decussatae* of Bentham (1876), who notes: "The opposite-leaved species of the series *Spiciflorae* differ in the dense, many-flowered spikes and those of the *Capitatae* in the flowers, whether in heads or solitary, being always at the ends of the branches at the time of expanding."

The new species approaches close to *M. acuminata* F. Muell. but differs in the generally longer narrower leaves [and in the shorter staminal column].

16. *Melaleuca pauperiflora* F. Muell., *Fragm.*3(1862)116; Benth., *Fl.Austral.*3(1867)161; Diels & Pritzel, *Bot.Jahrb.Syst.*35(1905)429; Cheel, *Trans.R.Soc.S.Austral.*43(1919)370, t.38; *Black Fl.S.Austral.ed.*1(1926)411, t.39, f.5-9; ed.2(1952)612, t.816; Blackall & Grieve, *West.Austral.Wildfl.*1(1954)300, in clava.

[*Type*: Western Australia, "in montibus Phillips Range", *Maxwell s.n.*]

Melaleuca sheathiana Fitzg., *J. Proc. Muell.Bot.Soc.W.Austral.*1/9(1902)16; Blackall & Grieve, *West.Austral. Wildfl.*1(1959)300, in clava.

[*Type*: Western Australia, Lakeside and Black Flag, *Fitzgerald s.n.*]

Intricately branched shrub to 3 m high; young shoots often pubescent, branchlets white, branches dark grey, bark loose and papery. Leaves scattered, ascending or spreading, glabrous, petiole flat, about 1 mm long, lamina linear, nerveless, apparently smooth, thick, semi-terete or almost terete, 4-12 mm long, about 1 mm broad, apex broadly rounded, often almost hemispherical, usually with a small hard tooth-like point at the apex towards the lower surface. Vegetative and flowering buds enclosed in several series of closely overlapping scales, of which the upper are larger, scales ovate, caducous leaving scars on the branchlets. Inflorescence a condensed head-like spike of 3-6 flowers, terminal, often with several axillary spikes formed around the terminal one, the axes growing out after flowering; calyx tube glabrous, ovoid, about 2 mm long, 1.5 mm broad, lobes deltoid, about 1 mm long, 1 mm broad at the base, with scarious margins; petals 2 mm long, white; stamens white, claws shorter than the petals, bearing 7-15 about 2.5-3.5 mm long filaments in two rows at their apex. Style about 4 mm long. Fruit globular, 4-5 mm diameter, in small clusters, not sunk in the rachis, orifice about 1-2 mm diameter. (Fig. 16.)

Distribution (Map 9)

Western Australia and South Australia.

Selection of Specimens examined

LAKE EYRE BASIN (2): *Boomsma s.n.*, ca. 100 km N of Tarcoola, 24.ix.1974; 3, Lake Phillipson, 25.ix.1974.

NULLARBOR (3): *Pastoral Board s.n.*, Mulgathing, 26.ix.1960.

GAIRDNER-TORRENS BASIN (4): *Cleland s.n.*, ca. 25 km N of Wilgena Station, 26.xi.1925. *Forde 723*, Lake Windabout, 1.iii.1957. *Lay 170*, NE of Malbooma, 25.xi.1970. *Lothian 2670*, Arcoona Station, 1.v.1964. *Murray s.n.*, Yeltacowie, 3.vi.1927; 8.viii.1927. *Taylor s.n.*, Wallabyng, May, 1919. *Weber 1454*, Andamooka Station, 9.ix.1968.

EYRE PENINSULA (7): *Aitken M3*, W of Penong, April, 1973. *Alcock s.n.*, ca. 12 km SW of Kimba, November, 1963. *Black s.n.*, Minnipa, 11.xi.1915; *s.n.*, Poochera, October, 1942. *Canning 023594*, Ceduna, 1.ix.1968. *Ising s.n.*, Arno Bay, 26.viii.1935. *Rohrlach 114*, Pinkawillinie; 567, Caralue Bluff, 20.ix.1959. *Wheeler 852*, Hincks N.P., 7.x.1968. *Whibley 409*, S of Buckleboo, 19.x.1958. *Wilson 1606*, ca. 6 km NW of Fowlers Bay, 12.ix.1960.

NORTHERN LOFTY (8): *Donner 1864*, Port Wakefield, 12.x.1966. *Lothian 1505*, ca. 9 miles (14 km) S of Port Wakefield 23.x.1955.

MURRAY (9): *Cleland s.n.*, Mantung, 18.viii.1924. *Spooner 4677*, Karoonda, 19.vi.1976. *Wilson 41*, Chauncey's Line, 23.ix.1958.

YORKE PENINSULA (10): *Cooper s.n.*, near Port Broughton, 12.x.1954. *Tepper 159*, Ardrossan, September, 1879. *Weber 3853*, 1 km S of Port Julia, 21.viii.1974.

SOUTHERN LOFTY (11): *Black s.n.*, Dublin, 15.ix.1907.

Black (1926) made no mention of *M. sheathiana*, but later (1952) listed it as a synonym of *M. pauperiflora*. Blackall & Grieve (1959) retained them as distinct species. Two questions arise: are these two distinct species and, if so, to which do the South Australian plants belong?

Mueller described *M. pauperiflora* in 1862 from Western Australia, and Bentham (1867) provided some additional data. Fitzgerald (1902) listed the chief differences between his new species *M. sheathiana* (also from Western Australia), and *M. pauperiflora* as being: foliage (leaves shorter) hirsute calyx tube, few ovules and size and shape of fruiting calyx (urceolate, 2-2.5 x 2 mm, immersed).

Cheel (1919) surveyed the relationships between the two species and quoted a note by Fitzgerald on the type sheet: "After an examination of numerous specimens of *M. pauperiflora* F.v.M., including the type, I am convinced that *M. sheathiana* cannot be maintained as a distinct species". Cheel, however, concluded that the extreme forms were so distinct that it may be advisable to regard the smaller-leaved forms as a variety of *M. pauperiflora*.



Fig. 16. *M. pauperiflora*. A, twig, x 1/2; B, leaf, x 2 1/2; C, flower, x 6; D, stamen bundle, x 10; E, fruits, x 3/4.

Fig. 17. *M. raphiophylla*. A, twig, x 1/2; B, leaf, x 2; C, flower, x 4; D, stamen bundle, x 5; E, fruits, x 2/3.

[Carrick considered it likely that two subspecies should be recognized in South Australia: one from the southern districts, and a new subspecies from the Lake Eyre, Nullarbor, Gairdner-Torrens and Flinders regions and one specimen from the Murray at Mantung. He did not record the characters on which these would be separated, but superficially the proposed new subspecies has paler more yellowish broader and shorter and slightly arcuate leaves and whiter fruits. A thorough study of the species over its whole range is needed to evaluate this proposal. Further work is also needed on the differences between *M. pauperiflora* and *M. lanceolata*.]

17. *Melaleuca raphiophylla* Schau. in Lehm., Pl. Preiss. 1(1844)143; Benth., Fl. Austral. 3(1867)147; Blackall & Grieve, West. Austral. Wildfl. 1(1954)302; Eichler, Suppl. Black's Fl. S. Austral. (1965)234.

[Types: Western Australia, Swan River above Perth, Preiss 264; Avon River near York, Preiss 267.]

Melaleuca hamulosa [non Turcz.] sensu Ising, Trans. R. Soc. S. Austral. 81(1958)168.

Tall shrub or small tree to 5 m high (in South Australia), glabrous except the very young pubescent shoots, branchlets whitish, branches pale grey, bark stripping off in papery sheets. Leaves scattered, ascending or almost patent, narrow-linear, somewhat plano-convex, straight or recurved in the upper part particularly when young, cuneate into a 1 mm petiole, acute with a short, soft, straight or recurved mucro, glands on the lower surface conspicuous when young, 1-2 cm long, 0.5-1 mm broad. Inflorescence a cylindrical spike, the axis growing out before anthesis, rachis glabrous; calyx tube closely sessile, more or less cylindrical, expanded and truncate at the base, glabrous, about 1.5 mm long, 2.5 mm diameter, lobes triangular-ovate, acute, margin scarious, glabrous outside and in, about 0.5 mm long, 1 mm broad; corolla white, petals circular, concave, glabrous, about 2.5 mm across, claw very short; stamens whitish, claw 4-5 mm long bearing 15-20 filaments 2-3 mm long pinnately in two series towards the apex; style about 6 mm long, scarcely expanded at the apex, stigma almost flat. Fruits close together, not compacted, partially embedded in the axis, subcylindric, about 2.5 mm long, 4-6 mm diameter, constricted at the apex, aperture about 2 mm across. (Fig. 17.)

Needle-leaved honey-myrtle

Distribution (Map 10)

Western Australia and South Australia.

Specimens examined

EYRE PENINSULA (7): *Blaylock 1904*, 3 km N of Hiltaba H.S., 4.ix.1972; *1924*, *ibid.*, 5.ix.1972. *Chinmock 2956*, Mt Yardea, 21.x.1975. *Copley 2081*, 7 km W of Yardea H.S., 31.viii.1968. *Cornwall 26*, Carapee Hill, 20.vi.1967. *Crisp 782, 790*, Carapee Hill, 18.v.1974. *Donner 3145*, 40 km NNE of Minnipa, 27.x.1968. *Gardiner s.n.*, N shore Lake Gairdner, 12.x.1969. *Haegi 751*, 50 km from Minnipa towards Yardea, 17.x.1975. *Ising s.n.*, Wudinna Hill, 1.ix.1935, 7.ix.1928, 29.ix.1939; *s.n.*, Gawler Ranges, 13.ix.1938, 2.xi.1939. *Jackson 2030*, Mt Wallaby, 24.ix.1972. *Johns s.n.*, Wudinna, -vi.1938. *Lay 684*, 5 km S of Yarna H.S., 29.ix.1972. *Leiblich s.n.*, Carapee Hill, 26.ix.1969, 16.xi.1969; *s.n.*, Kimba, s.d. *Mason 133, 238*, Carapee Hill, 14.ix.1974. *Orchard 1793*, 40 km from Minnipa towards Yardea, 27.x.1968. *Rohrlach 445*, Carapee Hill, 30.viii.1959; *s.n.*, Coral Rocks, Thurlga H.S., 8.x.1962. *Scoles 37*, 48 km E of Wirrulla, 10.vi.1967. *Spooner 2398*, Hiltaba, 5.ix.1972. *Symon 8087B*, 21 km SW of Yardea, 2.x.1972; *8041*, Mt Nott, 1.x.1972; *8307*, Mt Wallaby, 10.x.1972; *8373*, Norlaby Well, 6.x.1972; *9678*, Carapee Hill, 16.ix.1974. *Warnes s.n.*, Yardea H.S., 1.ix.1968. *Weber, 3083*, NE of Koondoolka, 23.ix.1972; *3371*, Mt Double, 4.x.1972.

Comments:

Ising (1958) first drew attention to this taxon as new to South Australia, but recorded it as *M. hamulosa* Turcz., [described from Western Australia], basing his identification on his collection of 1.ix.1935 and that of Johns of 21.vi.1938. Eichler (1965), while retaining *M. hamulosa*, added *M. raphiophylla* to the flora of South Australia, based on Rohrlach's collection of 8.x.1962.

From the original descriptions, and those given by Bentham (1867), the South Australian collections are placed in *M. raphiophylla*.

M. hamulosa differs in having leaves erect mostly under 1 cm long, calyx cup-shaped more or less rounded below, calyx lobes rounded, fewer stamens (6-12) on each claw, and smaller (about 3 mm diam.) fruits borne in closely compacted spikes.

18. *Melaleuca squamea* Labill., Nov.Holl.Pl.Spec.2(1806)28, t.168; Edwards, Bot.Reg.6(1820)477; DC., Prodr.3(1828)313; Benth., Fl.Austral.3(1867)155; Tate, Fl.Extratrop.S.Austral.(1890)92, in clave, 231; Black, Fl.S.Austral.ed.2(1952)609, t.811; Curtis, Stud.Fl.Tasm.ed.1(1956)201; ed.2(1975)204.

[Type: "in capite Van-Diemen" (Tasmania), *Labillardiere s.n.*]

Melaleuca ottonis Schau. in Otto & Dietr., Allg.Gartenz.3(1835)167.

[Type: In cultivation in the Berlin Botanic Gardens.]

Melaleuca squamea var. *glabra* [non Cheel, J.Roy.Soc.N.S.W.58(1924)193] sensu Black, Fl.S.Austral.ed.1(1926)409.

Shrub 1-3 m high or sometimes a small tree to 6 m high, branchlets villous at first but sometimes becoming glabrescent (stem apex with two kinds of hairs; dense short patent downy hairs, and sparse long straggling hairs), greyish, bark corky. Leaves alternate, crowded, spreading, lanceolate, acute or acuminate, incurved towards the apex, 3-nerved, shortly petiolate, 4-8 mm long, 1.5-3 mm broad. Flowers in small terminal heads or short spikes, about 15 mm diameter; bracts broad, 3-nerved and persistent during flowering, 3-5 mm or more long; rachis silky, elongating after flowering; calyx-tube about 3 mm long, campanulate, becoming glabrous, lobes short, deltoid, green, about 1 mm long and broad; petals purple, glabrous, shortly clawed, 2-3 mm long, to 2 mm broad; stamens purple or pink, claw much shorter than the petals, less than 1 mm long, with 5-7 filaments about 5 mm or more long at the end; style 4-6 mm long, slightly expanded at the apex, stigma convex. Fruits almost urnshaped, in a dense globular cluster, 5-7 mm diameter, orifice undulate, about 2.4 mm across. (Fig. 18.)

Swamp or heath honey-myrtle

Distribution (Map 10)

New South Wales, Victoria, Tasmania and South Australia.

Selection of Specimens examined

SOUTHERN LOFTY (11): *Black s.n.*, Myponga, 10.xi.1906, 10.x.1923; *s.n.*, Yankalilla, 22.ii.1928. *Cleland s.n.*, Mt Compass, 27.x.1920, 23.x.1965, 29.ii.1964; *s.n.*, Myponga, 2.xii.1923; *s.n.*, Hindmarsh Valley, -.i.1936. *Eichler 13888*, Square Waterhole, 30.vi.1957. *Gemmell 337*, Mt Compass, 6.xi.1974. *Hunt 2539*, Nangkita, 21.x.1965. *Ising s.n.*, Myponga, -.x.1932. *Spooner 349*, Tooperang, 7.ii.1968; *4515*, Mt Compass, 11.i.1976. *Whibley 16*, Mt Compass, 15.xi.1956.

KANGAROO ISLAND (12): *Cleland s.n.*, Rocky River, 18.xi.1924; *s.n.*, Flinders Chase, 28.x.1967. *Eichler 15306*, Brookland Park, 8.xi.1958. *Jackson 992*, Harriet River H.S., 4.xi.1973.

SOUTHERN-EASTERN (13): *Black s.n.*, road to Glencoe, 27.xi.1911; *s.n.*, Mt Gambier to Glencoe, 27.xi.1917; *s.n.*, Burrungule, 12.x.1928. *Bowman s.n.*, Poltalloch, s.d. *Cleland s.n.*, Mt Burr Forest, -.iii.1931. *Ising s.n.*, Burrungule, -.x.1931; *s.n.*, The Springs, 20.x.1934. *Kraehenbuehl 988*, Mt Gambier to Glencoe, 10.x.1963. *Welbourn 208*, Glencoe to Wandilo, 24.x.1964. *Wilson 583*, 4 km E of Glencoe, 13.x.1966; *888*, Marsh's Swamp, 12.x.1968.

Comments:

Black (1926) placed the South Australian specimens under *M. squamea* var. *glabra* Cheel, but later (1952) considered them to be typical of the species. Examination of the South Australian specimens shows quite wide variation in hairiness, the youngest parts being very downy and the leaves and branchlets (and often the branches) generally retaining the typical downy, silky or villous indumentum. Cheel had not seen specimens from South

Australia and it is possible that specimens from the other localities mentioned by him are distinctive. Other criteria conform so closely with type that retention of var. *glabra* at least in so far as South Australia is concerned does not seem feasible.

[A suspected hybrid with *M. squarrosa* has been collected at Marsh's Swamp (S.E. region).]



Fig. 18. *M. squamea*. A, twig, nat. size; B, leaf, upper surface, x 5; C, leaf, lateral view, x 5; D, flower, x 4; E, stamen bundle, x 5; F, fruits, nat. size.



Fig. 19. *M. squarrosa*. A, twig, nat. size; B, leaf, lower surface, x 3; C, flower, x 6; D, stamen bundle, x 5; E, fruits, slightly reduced.

19. *Melaleuca squarrosa* Donn ex Sm., Trans.Linn.Soc.6(1820)300; (Donn, Hort.Can-tab.ed.2(1800)101 nomen nudum); Labill., Nov.Holl.Pl.Spec.2(1806)28, t.169; DC., Prodr.3(1828)215; Benth., Fl.Austral.3(1867)139; Tate, Fl.Extratrop.S.Austral.(1890)92, in clave, 231; Black, Fl.S.Austral.ed.1(1926)407; ed.2(1952)607, t.805; Curtis, Stud.Fl.Tasm.ed.1(1956)201; ed.2(1975)204.

[Type: grown by Donn in Cambridge, England, from seeds from Port Jackson, (Sydney).] *Melaleuca myrtifolia* Vent., Jard. Malm. 1(1804)47.

[Type: cultivated in France, originating in "Iles de la Mer du Sud."]

Erect shrub or tree 3-6 or even 12 m high, glabrous or the young shoots pubescent; branchlets greyish; bark corky and papery. Leaves mostly opposite and decussate, shortly but distinctly petiolate, ovate to ovate-lanceolate, sometimes cordate, acute and often almost pungent, rigid, spreading, distinctly 5-7-nerved, usually 5-10 mm long, 5-7 mm broad. Flowers in cylindrical spikes, at first terminal or sometimes growing behind the ends of the branches, 2-4 cm long and about 2 cm diameter, rachis pubescent, bracts green, broadly ovate, 4-6 mm long and about as broad; calyx tube cup-shaped, glabrous or pubescent, 1.5-2.5 mm long, lobes short, green, obtuse, about 1 mm long; petals white, glabrous, entire, almost circular, about 2 mm diameter; stamens white or pale yellow, claw much shorter than the petals, with 7-12 filaments about 5-6 mm long; style 6-10 mm long,

scarcely expanded at the apex, stigma truncate or concave. Fruits cup-shaped, not immersed in rachis or coalescing, about 4 mm long, with orifice about 2-3 mm across, forming a rather long and dense spike. (Fig. 19.)

Bottle-brush tea-tree or scented paper-bark

Distribution (Map 11)

New South Wales, Victoria, Tasmania and South Australia.

Specimens examined

SOUTH-EASTERN (13): *Alcock 841*, Woolwash, 30.x.1965. *Anon. s.n.*, King Island, 1931 (ADW); *s.n.*, Glencoe to Tantanoola, 6.xi.1932 (ADW); *Ashby 490*, Millicent, 3.xi.1940. *Black s.n.*, Mt Gambier to Glencoe, 27.xi.1917; *s.n.*, Dismal Swamp, 5.xii.1917; *s.n.*, Millicent, -ii.1948. *Carrick 2239*, Canunda N.P., 19.vii.1969. *Cleland s.n.*, Kalangadoo to Millicent, 6.xii.1922; *s.n.*, Macdonnell Bay, 29.v.1925; *s.n.*, Blanche S.F., 28.v.1928; *s.n.*, Mt Burr forest, 30.v.1928; *s.n.*, scrub E of Glencoe, -iii.1931; *s.n.*, Ewens Ponds, 30.x.1941; *s.n.*, Port MacDonnell, 1.xi.1941; *s.n.*, Rendelsham, 4.iii.1944; *s.n.*, 10 km SE of Cape Banks, 28.ii.1945; *s.n.*, Lake Bonney, 17.v.1962. *Copley 3028*, 16 km W of Mt Gambier, 9.iii.1970. *Crocker s.n.*, south-east, 11.xi.1939 (ADW); *Eardley s.n.*, Eight-mile Swamp, 3.ii.1942, 5.ii.1942 (ADW). *Hunt 465*, Dismal Swamp, 21.xi.1961; *1904*, Eight-mile Creek, 14.ii.1964. *Ising s.n.*, The Springs, 19.x.1934, 22.x.1934. *Jackson 259*, 6.5 km NW of Port MacDonnell, 19.xi.1959. *Kraehenbuehl 940*, Ewens Ponds, 5.x.1963. *Lothian 2954*, Piccaninnie Blue Lake, 29.viii.1964. *Schomburgk Herb.s.n.*, Lake Edward, 1.xii.1882; *s.n.*, MacDonnell Bay, s.d. *Symon 8379*, Dismal Swamp, 10.xi.1972 (ADW). *Welbourn 93*, Furner, 11.ix.1963. *Wilson 639*, 2.6 km N of Wandilo, 5.xi.1966; *920*, Marsh's Swamp, 26.x.1968. *Wilson 1129*, Mt Burr forest, 11.xi.1959.

Comments

[Labillardiere (1806) cited *M. myrtifolia* as a synonym for *M. squarrosa*, which he had collected in Tasmania. It is possible that he may also have provided the material from which the cultivated type of *M. myrtifolia* was grown.]

20. *Melaleuca uncinata* R.Br. ex Ait.f., Hort.Kew ed.2, 4(1812)414; DC., Prodr.3(1828)213; Benth., Fl.Austral.3(1867)150; Tate, Fl.Extratrop.S.Austral.(1890)93, in clave, 231; Bailey, Queensl. Fl.2(1900)602; Black, Fl.S.Austral.ed.1(1926)409; ed.2(1952)611, t.813; Blackall & Grieve, West.Austral.Wildfl.1(1954)300, 301, in clave.

[Type: "South Coast of New Holland", *R. Brown s.n.* introduced to cultivation at Kew by Peter Good.]

Melaleuca drummondii Schau. in Lehm., Pl.Preiss.1(1844)138.

[Type: "Nova-Hollandia austro-occidentali", *J. Drummond s.n.*]

Melaleuca semiteres Schau. in Lehm., Pl.Preiss.1(1844)143.

[Type: "Nova-Hollandia austro-occidentali", *J. Drummond s.n.*]

Melaleuca hamata Field. & Gardn., Sert.Pl.(1844)t.74.

[Type: "Swan River Colony", *J. Drummond 116.*]

Erect broom-like shrub 1-3 m high, glabrous except on the young greyish branchlets; bark grey and papery. Leaves alternate, ascending, almost sessile, terete, with numerous immersed glands, acute, terminating in a fine usually curved point, with appressed silvery hairs when young, 1.5-6 cm long, about 1 mm thick. Flowers in dense globular or shortly oblong heads on short axillary peduncles which often grow out even before flowering is completed, rachis pubescent, bracts broadly ovate, almost auriculate, pubescent below, 1-3-veined, 2-3 mm long, almost as broad; calyx tube cup-shaped, silky-pubescent, about 1.5 mm long; lobes very short, obtuse, pubescent; petals orbicular-ovate, about 1.5 mm diameter; stamens white or yellowish, claw longer than the petals, about 2 mm long, each with 4-7 filaments about 2 mm long; anthers broader than long; style about 5-6 mm long, scarcely expanded at the apex, stigma convex. (Fig. 20.)

Broombush or broom honey-myrtle

Distribution (Map 12)

Western Australia, Queensland, New South Wales and South Australia. *Victoria*

Selection of Specimens examined

NORTH-WESTERN (1): *Francis s.n.*, Wallatina, 2.8.1953.

LAKE EYRE BASIN (2): *Basedow s.n.*, MacDouall Peak, May, 1917. *Lay 595*, MacDouall Peak, 9.x.1971.

NULLARBOR (3): *Gianakos 3179*, ca. 3 km E of Immarna, 14.ix.1970. *Lothian 3671*, ca. 8 km N of Pidinga, 20.iv.1966; *4039*, ca. 40 km S of Ooldea, 3.vi.1967.

GAIRDNER-TORRENS (4): *Cleland s.n.*, ca. 16 km N of Wilgena Station, 20.xi.1925. *Lay 456*, ca. 4.8 km W of Rickaby Dam, 18.ix.1971; *654*, Bore 20, Millers Creek Station, 14.x.1971.

FLINDERS RANGE (5): *Callen s.n.*, Mainwater Pound, 8.x.1969. *Eichler 12622*, ca. 65 km E of Leigh Creek, 15.ix.1956. *Lothian 3606*, summit of Mt McKinlay, 17.ix.1965. *Symon 3036*, near Balcanoona Station, 11.x.1964.

EYRE PENINSULA (7): *Cornwall 32*, Carappee Hill, 20.vi.1967. *Spooner 2243*, Hiltaba H.S., 3.ix.1972. *Swaby s.n.*, Hambidge Reserve. 27.iv.1966.

MURRAY (9): *Czornij 699*, ca. 15 km W of Murray Bridge, 22.vii.1974. *Ising s.n.*, Kinchina, 16.x.1930. *Specht 2290*, Hd of Billiatt, 13.x.1960.

YORKE PENINSULA (10): *Copley 2938*, ca. 6 km N of Maitland, 13.xii.1969. *Orchard 2797*, ca. SSW of Ardrossan on road to Curramulka. *Short 4*, ca. 5.5 km SSW of Port Julia.

SOUTHERN LOFTY (11): *Cleland s.n.*, Goolwa, 14.xii.1940. *Green 206*, Stirling Hills, 22.viii.1950.

KANGAROO ISLAND (12): *Andrew s.n.*, Kingscote, 8.v.1914. *Ising s.n.*, MacGillivray, 30.xii.1922. *Schodde 32*, American River, 4.ii.1956.

SOUTH EASTERN (13): *Beauglehole 19447*, SW of Bool Lagoon 16.xii.1963. *Carrick 3407*, Scorpion Spring National Park, 21.x.1973. *Green 1845*, 3 miles SE of Tintinara, 23.viii.1958. *West 2262*, Mt Shaugh Conservation Park, 2.x.1977.

Comments

[The type was collected by R. Brown on "the South Coast of New Holland". Bentham (1867) cited a Brown collection from Port Lincoln (S.A.) and this may therefore be the type locality.]



Fig. 20. *M. uncinata*. A, twig, x 1/2; B, leaf, nat. size; C, flower, x 6; D, stamen bundle, x 12; E, fruits, x 1/2.



Fig. 21. *M. wilsonii*. A, twig, x 1/2; B, leaf, upper surface, x 2; C, flower, x 3 1/2; D, stamen bundle, x 5; E, fruits, x 2/3; F, fruit, x 2.

21. **Melaleuca wilsonii** F. Muell., *Fragm.* 2(1861)124, t.15; Benth., *Fl. Austral.* 3(1867)134; Tate, *Fl. Extratrop. S. Austral.* (1890)92 in clava, 231; Black, *Fl. S. Austral.* 3d.1(1926)406, ed.2(1952)607; Willis *Handb. Pl. Vict.* 2(1972)452.

[*Types*: South Australia, "in deserto plagae Tatiara Country", *J.E. Woods, s.n.*; "in eremo circum lacun Hindmarsh", *J. Dallachy s.n.*]

Low straggling intricate shrub, 20-150 cm high, branchlets pale grey, branches darker, rough, fissured. Leaves decussate, crowded at apex of branchlets, erect or ascending, becoming almost patent particularly in flower, linear-lanceolate, acuminate-acute, sessile by a broad base, slightly concave above, obscurely glandular and 3-veined below, 8-15 mm long, 1-2 mm broad, Spikes axillary, rarely terminal, subtended by several membranous imbricate pubescent bracts, peduncles very short, flowers 2-5, bracteoles apparently absent; calyx tube cup-shaped, pubescent outside, about 2.5 mm long, lobes deltoid, pubescent outside and in, with a broad scarious margin about 2 mm long, 1.5 mm broad at base; petals glabrous, entire, broadly oval, 2.5 mm long, 1.5 mm broad, claw very short; stamens pale or deep pink, claw about 6 mm long, bearing 7-15 filaments 3-4 mm long at the end; style 8-10 mm or more long, slightly expanded at apex, stigma convex. Fruits corky, fissured, borne in dense or scattered clusters on rough thickened old wood, almost cylindrical, base flat, apex truncate, rim thick, crowned by woody bases of calyx lobes, 3-5 mm long, about 5 mm diameter, aperture pentagonal, about 3 mm across. (Fig. 21.)

Violet honey-myrtle

Disribution (Map 13)

Victoria and South Australia.

Specimens examined

SOUTH-EASTERN (13): *Andrew s.n.*, Coonalpyn, 15.iii.1919. *Ashby s.n.*, Wirrega, 22.xi.1944. *E.C. Black s.n.*, Coonalpyn, -.x.1950. *Cleland s.n.*, Bordertown, 24.xi.1917; *s.n.*, W. of Bordertown, 26.xi.1917; *s.n.*, Coonalpyn, -.iv.1926, -.v.1926. *Dwight s.n.*, 90-mile desert, 9.xi.1953. *Hunt 232*, Hd Senior South, 15.x.1961. *Ising s.n.*, Bordertown, 13.x.1916, 14.x.1916; *s.n.*, Tintinara, 23.x.1919; *s.n.*, Coonalpyn Downs, 27.x.1922. *Kraehenbuehl 1222*, Ki Ki, 5.xi.1964; 1227, 12 km N of Wolseley, 6.xi.1964. *Litchfield 136*, Hd. Pendleton, -.ix.1950; *s.n.*, Hd Senior, -.xi.1950. *Menzel s.n.*, Mt Gambier, -.xi.1897. *Roach 44*, Willalooka, 21.xi.1970. *Stace s.n.*, 10 km N of Wirrega, 30.x.1955. *Symon 8378*, S of Bordertown, 10.xi.1972. *Welbourn 92*, Furner, 11.ix.1963; 212, 10 km N of Wirrega, 25.x.1964.

Comments

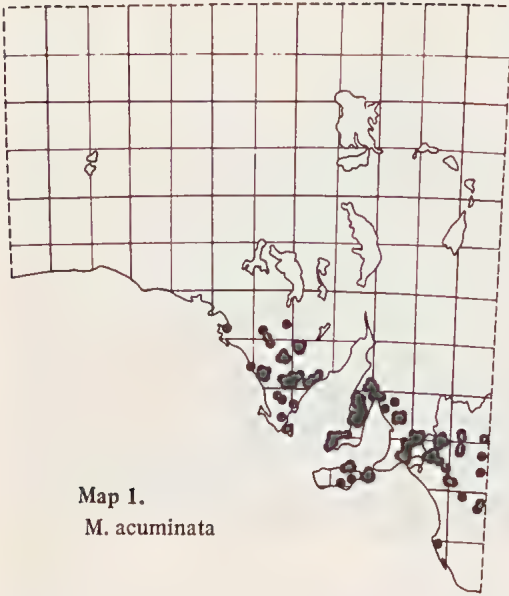
There are two specimens from the Tate herbarium, University of Adelaide, now held at AD, one annotated by Tate: "Melaleuca Wilsoni Kangaroo Is. 1895", the other similarly, in a different hand, with the addition of "October". As far as is known, the species has not been collected on Kangaroo Island since.

Excluded species

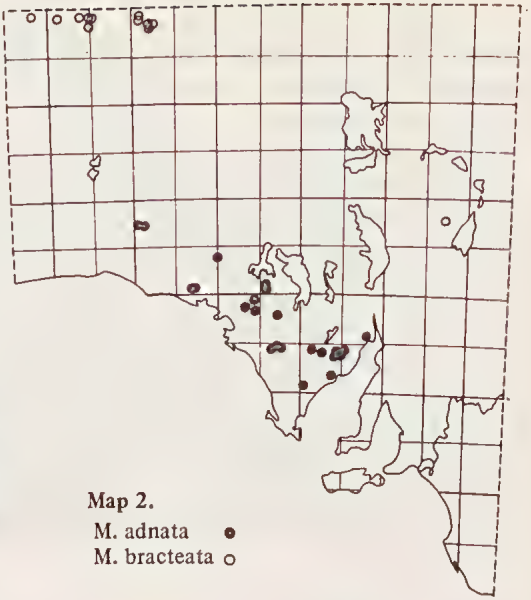
1. **Melaleuca quadrifaria** F. Muell., *Wing's South Sci.Rec.*, n.s.2(1886); Tate, *Fl. Extratrop. S. Austral.* (1890)93, in clava, 231; Black, *Fl. S. Austral.* ed.1(1926)407, t.39, f.1-4; ed.2(1952)609, t.808; Blackall & Grieve, *West. Austral. Wildfl.* 1(1954)295, in clava.

[*Type*: Western Australia, near Eucla, *T.D. Bate s.n.* (MEL, seen by Carrick; AD).]

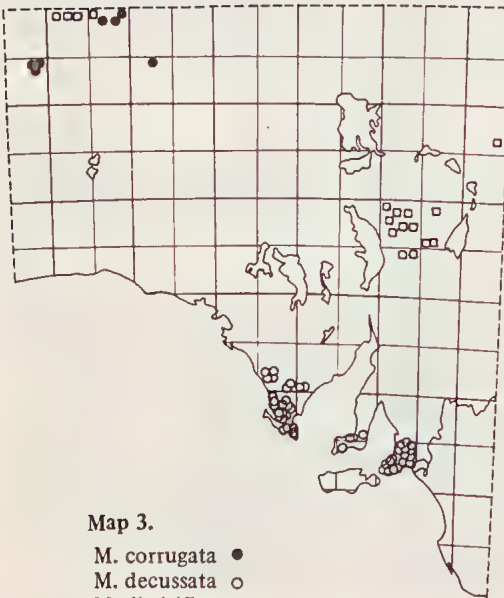
There are no specimens in AD to substantiate Black's inclusion of *M. quadrifaria* in the Flora of South Australia. AD97137174 has mounted on it a sheet from Black's herbarium with (a) two fragments annotated "A branchlet from the type Eucla 1886 (J.D. Batt). See my drawings and description in *Trans. Roy. Soc. S.A.* 1919"; (b) drawings of leaves with notes; (c) "Copy of manuscript notes on *Melaleuca quadrifaria* by Baron v. Mueller".



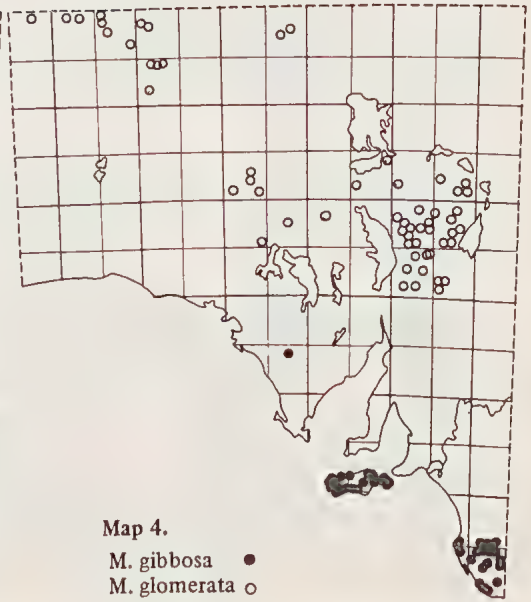
Map 1.
M. acuminata



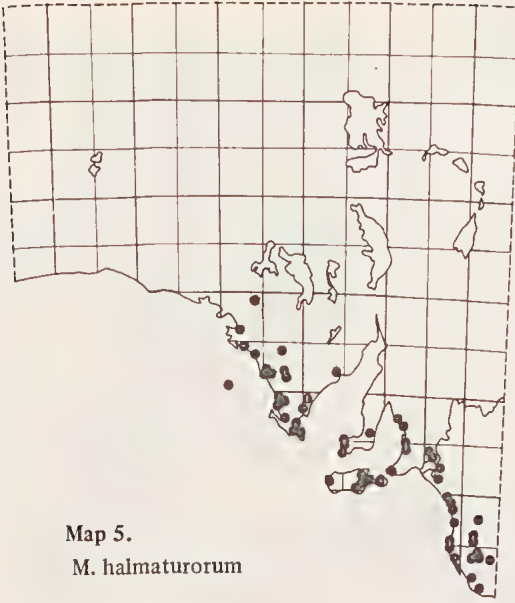
Map 2.
M. adnata ●
M. bracteata ○



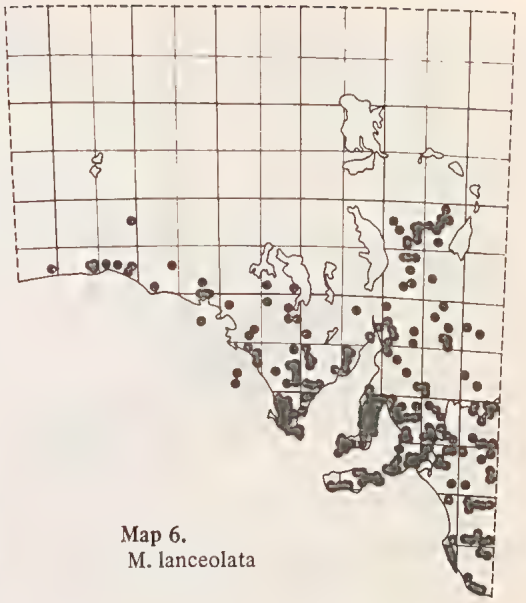
Map 3.
M. corrugata ●
M. decussata ○
M. dissitiflora □



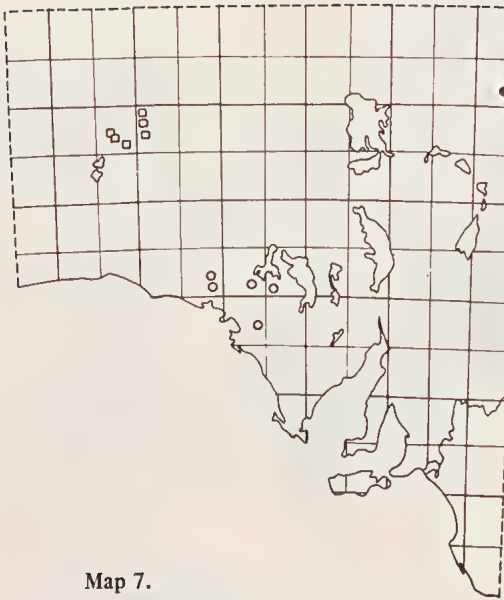
Map 4.
M. gibbosa ●
M. glomerata ○



Map 5.
M. halmaturorum



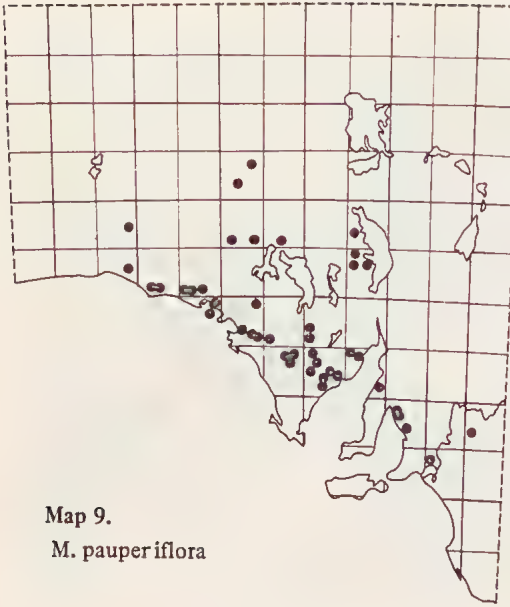
Map 6.
M. lanceolata



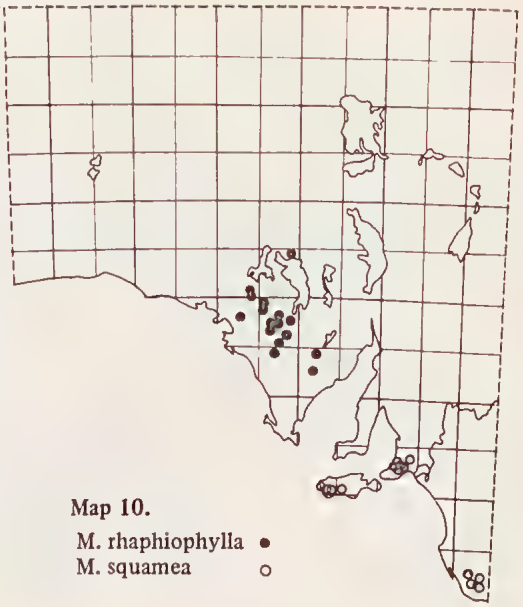
Map 7.
M. leiocarpa ○
M. linariifolia ●
M. nanophylla ○



Map 8.
M. neglecta ●
M. oxyphylla ○



Map 9.
M. pauperiflora



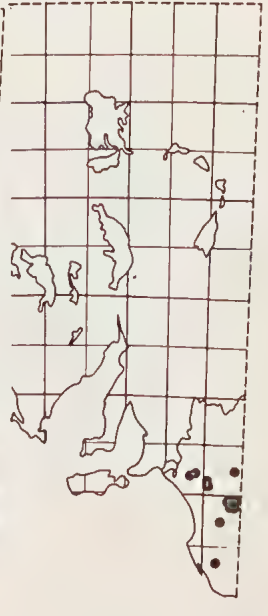
Map 10.
M. rhapsiophylla ●
M. squamea ○



Map 11.
M. squarrosa



Map 12.
M. uncinata



Map 13.
M. wilsonii

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Index to Scientific Names

Names

New names are in bold. Synonyms, misapplied, misspelt or illegitimate names are in italics.

Page numbers

Page numbers in bold refer to the main taxonomic treatment. Page numbers asterisked refer to figures and maps.

Cajuputi

—*pubescens* 296

Melaleuca 281-319

:Decussatae 306

:Peltatae 302

—*acuminata* 282, 283, **284**, 285*, 306, 314*

—*adnata* 282, 283, **285***, 286, 314*

—*alternifolia* 299

—*bracteata* 282, 283, **286**, 287*, 291, 314*

—*corrugata* 282, 283, 287*, **288**, 314*

—*curvifolia* 296

—*daleana* 286

—*deanii* 295

—*decussata* 282, 283, **288**, 290*, 292, 314*

ovoidea 288, 289

—*deltoidea* 303

—*dissitiflora* 283, 284, **290***, 291, 314*

—*drummondii* 311

- elegans* 288
- eleutherostachya* 286
 - abietina* 285, 286
- ericifolia* 303
- fasciculiflora* 303
- foliolosa* 302
- genistifolia* 297
 - coriacea* 286
- gibbosa* 281, 282, 283, 292, 293*, 314*
- glaucoalyx* 286
- glomerata* 281, 283, 284, 293*, 314*
- hakeoides* 293
- halmaturorum* 282, 283, 294, 295*, 315*
 - enervis* 295
 - tuberculifera* 295
- hamata* 311
- hamulosa* 309
- hamulosa* 308
- lanceolata* 282, 284, 291, 295*, 296, 297, 315*
- leiocarpa* 282, 283, 297, 298*, 315*
- linariifolia* 282, 283, 298*, 299, 300, 315*
- linophylla* 291
- linophylla* 290, 291
- micromera* 302
- minutifolia* 301*, 302, 303
- monticola* 286
- myrtifolia* 310, 311
- nanophylla* 282, 283, 300, 301*, 302, 303, 315*
- neglecta* 282, 284, 303*, 315*
- oligantha* 288
- oraria* 303
- ottonis* 309
- oxyphylla* 282, 283, 304, 305*, 306, 315
- parviflora* 288, 296
 - pubescens* 296
- pauperiflora* 281, 282, 284, 297, 306, 307*, 316*
- preissiana* 297
- pubescens* 296, 297
- pumila* 288
- pustulata* 295
- pustulata* 294
- quadrifaria* 313
- rhaphiophylla* 283, 284, 307*, 308, 309, 316*
- semiteres* 311
- sheathiana* 306, 307
- squamea* 281, 282, 283, 309, 310*, 316*
 - glabra* 309
- squarrosa* 281, 282, 283, 310*, 311, 316*
- stricta* 298
- tamariscina* 302, 303
- tetragona* 288
- thyoides* 302, 303
- trichostachya* 299, 300
- trichostachya* 290, 298
- uncinata* 281, 283, 284, 311, 312*, 316*

—wilsonii 282, 283, 312*, 313, 316*

Metrosideros

—*hyssopifolia* 298

MYRTACEAE 281-318